Asian Nursing Research 13 (2019) 69–75

Contents lists available at ScienceDirect

Asian Nursing Research

journal homepage: www.asian-nursingresearch.com

Research Article

Validation of the Maternal Identity Scale for Primiparous Thai Teenage Mothers

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ARTICLE INFO

Article history:
Received 1 July 2018
Received in revised form
10 January 2019
Accepted 11 January 2019

Keywords:
adolescent
community health nursing
factor analysis, statistical
mothers
postpartum period

ABSTRACT

Purpose: The Maternal Role Attainment Scale Form B (MRAS-Form B) was developed based on Mercer's theory and widely used to assess maternal role attainment among Thai mothers in hospitals. To assess the maternal identity among primiparous adolescent mothers in communities, MRAS-Form B remains indistinguishable due to differences in both mothers' ages and circumstances and was modified to the Maternal Identity Scale (MIS). Therefore, the aim of this study was to examine the validity and reliability of the MIS.
Methods: A cross-sectional study was conducted among 397 primiparous Thai teenagers residing with their infants aged 4–12 months. Data were collected using self-administered questionnaires. Confirmatory factor analysis was performed to confirm the construct validity using Mplus Software.
Results: The overall model provided fit well to the empirical data (χ^2/df = 2.23, comparative fit index = .93, Tucker–Lewis index = .92, root mean square error of approximation = .06, standardized root mean square residual = .05). About 33–66% of the variance among MIS items could be explained by three constructs of maternal identity. Convergent validity showed item loadings ranging from .58 to .81; in addition, average variance extracted and composite reliability ranged from .44 to .54 and .82 to .92, respectively. Discriminant validity correlations between constructs were ranging from .74 to .87. The MIS exhibited very good item discrimination values (.52 ≤ corrected item-total correlation ≤.70) and an excellent reliability (Cronbach's α = .95).
Conclusion: Appropriately for community health nursing, the MIS was a valid and reliable tool, assessing maternal identity among primiparous teenage mothers one year after delivery.

Introduction

Motherhood, the characteristic qualities associated with a mother's bonding with her child, is required for all mothers who intend to have an infant and is related to the fundamental qualities needed in maternal and child life. The Becoming a Mother Theory of Mercer is a well-known nursing theory regarding maternal role attainment one year postpartum and is based on the maternal role identity concept of Rubin. Phases of maternal role attainment, motherhood, and maternal identity are synonymous, but maternal role attainment (MRA) was retired from Mercer's theory in 2004 because the meaning stresses attainment rather than continuous development [1–3]. The maternal identity (MI) is concerned with achieving and continuing to develop the maternal role occurring around four months after childbirth. MI denotes that a woman views herself as a mother based on three indicators: 1) attachment to the infant involves emotional commitment, feelings of love, and connectedness to the infant; 2) role competence is the ability and confidence for child rearing; and 3) gratification in the role involves a sense of fulfillment when interacting with the infant. Transitioning to achieve MI is a complex processes depending on physical, emotional, and cognitive maturity to learn and apply to become a competent mother. This contains a familiar development among adult women but a rare experience for teenagers in today's society [1,3].

The major predictors of MI adapting among adolescents are weaknesses during the first year after delivery, most include mothering immaturity, inexperienced caretaking, and having a baby unintentionally. They failed or delayed to achieve MI adapting and presented poor maternal tasks, low self-care behaviors, low infant care, and poor parenting quality [4–6]. Moreover,

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https://doi.org/10.1016/j.anr.2019.01.007

primiparous teenage mothers fulfilled their maternal roles at lower scores than multiparous and adult mothers, i.e., responsivity, touch, general speech toward the infant, and breastfeeding in early childhood. Their child's development at 24 months revealed a lower score than a child of an older mother, whereas child abuse and neglect had higher scores [5,7]. Although postpartum home health-care staff in the community intensively monitored the baby's wellness, they did not routinely assess MI one year after delivery. Because a mother with a higher MI adapting is more likely to become a better caretaker of her baby, an assessment tool is required to evaluate MI for adolescent mothers bearing their first child.

According to related studies, achieving and continuing maternal role development could be assessed using many instruments, e.g., 1) the Semantic Differential Scale—Myself as Mother, the Parenting Sense of Competence Scale, and the perception of maternal–infant interaction applied to assess MRA among first-time Korean adult mothers at four months postpartum [8]; 2) the Maternal Confidence Questionnaire was used to assess maternal confidence among first-time American adult mothers during their child's infancy [9]; 3) the Parenting Sense of Competence Scale modified to measure maternal competence among first-time adolescent mothers having infants aged 6–12 months in the US [10]; 4) the semantic differential scales—Myself as Mother and My Baby and the Self-Confidence Scale used to assess MI development among primiparous mothers from pregnancy to four months after delivery in Turkey [11]; 5) the Postpartum Self-Evaluation Questionnaire used to evaluate motherhood adapting among postpartum Turkish adolescent mothers [12]; and 6) the Postpartum Maternal Role Confidence Scale and maternal satisfaction scales used to assess MRA among first-time Japanese mothers during early postpartum [13].

In Thailand, 2004, Phumonsakul et al [14] revised 23 items of the Maternal Role Attainment Scale Form B (MRAS-Form B) from her original MRA Scale in 2000 and 2003 to evaluate MRA among 393 Thai working mothers six weeks postpartum in an outpatient department (OPD) clinic. Subsequently, this scale was frequently used, e.g., to assess MRA among first-time Thai adolescent mothers from 6 to 10 months postpartum [15] and Thai adult mothers having preterm babies [16]. In addition, MRAS-Form B was modified to create 24 items of the Short Form MRA Scale to assess MRA among Thai HIV-seropositive mothers from three to ten months postpartum [17] and 16 items to evaluate MRA among first-time Thai Muslim teenage mothers with infants aged four to six months [18].

Although MRAS-Form B was often used to assess MRA among Thai mothers, it was developed for working adult mothers having infants aged six weeks postpartum in an OPD clinic. Moreover, other researchers have used it to assess MRA among adolescent mothers in OPD clinics but did not confirm the validation of the scale [15,18]. It remains unclear how to assess MI adapting among primiparous adolescent mothers from 4 to 12 months. Therefore, we modified the 24 items of the Maternal Identity Scale (MIS) from MRAS-Form B because it was 1) developed based on Mercer's theory, having three dimensions, i.e., attachment, competence, and gratification; 2) used widely among Thai mothers; and 3) easy to use and interpret. The aim of this study was to examine construct validity and reliability of the MIS, considering whether the MIS was sufficiently appropriate to assess MI adapting among primiparous Thai teenage mothers at 4 to 12 months postpartum at the community.

Methods

Study Design and Participants

A cross-sectional survey was conducted among primiparous Thai adolescent mothers who were pregnant when they were younger than 20 years, residing with their infants aged between 4 and 12 months, without a diagnosis of abnormal birth, in three provinces of central Thailand. Individuals who were willing to participate in the study signed consent forms. Multivariate sample size calculated for the study was based on the rule of thumb, i.e., the N:q rule, the ratio of the number of cases (N) to the number of model parameters requiring statistical estimates (q) [19]. This study defined that ratio as 15:1, and total q involved 24 parameters requiring estimates. Therefore, the estimated sample size totaled 360 individuals, and to ensure completeness of the data, the number of individuals was increased by 20%. Consequently, the number of participants for data collection totaled 430 individuals.

Ethical Considerations

This study was approved by the Institutional Review Board of Faculty of Public Health, Mahidol University (Approval no. MUPH 2017-194). For those individuals younger than 18 years, consent was obtained from a legally authorized guardian such as a parent or husband who also signed the informed consent form. Each questionnaire was coded by a number to conceal the names of the participants.

Data Collection

All data were collected by the researchers and 100 home health-care staff who were trained individually; we collected data together. The participants who met the study criteria provided volunteer cooperation without any condition related to health-care services and agreed to sign the informed consent form. A self-administered questionnaire took about 20 minutes to complete. The data were collected at the participant's house using lottery method during the day when home health-care staff visited but after the home health-care services were finished or depending on the day that participants were available between November 2017 and February 2018. A total of 397 of 430 participants returned the questionnaire and completed data analysis; about 12% were excluded because of missing 10% or more important data.

Instruments

The 23-item MRAS-Form B comprised 1) maternal–infant attachment (6 items); 2) maternal role competence (8 items); and 3) maternal role satisfaction (9 items). All items were positive statements scored using a 5-point Likert scale, ranging from 1, strongly disagree, to 5, strongly agree [14]. For this study, MI refers to a primiparous adolescent mother perceiving herself as a mother comprising 1) attachment to the infant, i.e., visual contact, verbal interaction, touch, and holding; 2) role competence, i.e., sensitivity, empathy, responsiveness, and nurturing; and 3) gratification in the role, i.e., satisfaction, enjoyment, pleasure, and harmony. Because the original scale was not covered, 1) MI was defined for adolescent mothers 4 to 12 months after delivery and 2) some items overlapped. MRAS-Form B was modified to the 24-item MIS after obtaining permission, and three major areas were changed. First, three items were added regarding MI definition for adolescent mothers, i.e., verbal interaction, nurturing, and harmony to create item a6, “I speak in a gentle voice with my baby”, item c8, “I provide enough milk or food for my baby appropriately and correctly methods”, and item g10, “I feel in harmony and the maternal role is a part of my daily life.” Second, four items of the original were modified to two items because they overlapped. These included 1) item 4, “I can make my baby calm”, and item 13, “I am good soothing my baby”, were modified to create item c7 of MIS “when my baby cries, I am good at soothing”. In addition, 2) item 12, “I respond to my baby's needs appropriately”, and item 14, “I respond

to my baby's needs immediately", were modified to create item c6 of MIS "I respond to my baby's needs correctly." Moreover, item 8 "I am able to clean and care for my baby's skin", was changed to item c2 of MIS, "I take care of my baby's hygiene correctly, e.g., bathing and shampooing". In addition, item 16, "I feel happy when breastfeeding my baby", was changed to item g2 of MIS, "I feel happy when feeding my baby", to appropriately assess adolescent mothers from 4 to 12 months postpartum. Finally, the original MRA Scale, full version, was rated using a 4-point Likert scale, whereas MRAS-Form B was rated using a 5-point Likert scale. The Likert rating scale was applied in a scale consisting of both positive and negative statements. The MIS, using a 5-point rating scale, was applied because all items were positive statements.

As a result, the MIS comprised 24 items with three subscales, namely, 1) attachment to the infant (6 items; a1–a6), 2) role competence (8 items; c1–c8), and 3) gratification in the role (10 items; g1–g10). The scale was rated on a 5-point rating scale from 1 "strongly disagree" to 5 "strongly agree". Contents were approved for validity by three experts in three areas including 1) strategy management and policymaking for teenage mothers, 2) nursing science, and 3) public health science.

Data Analysis

SPSS software, version 18.0 (IBM Corp., Armonk, NY, USA), under Mahidol University license was used for descriptive statistics. The classical test theory included 1) internal consistency reliability: adequate ($.70 \leq \alpha < .80$), very good ($.80 \leq \alpha < .90$), and excellent ($\alpha \geq .90$) [20] and 2) item discriminant, corrected item-total correlation (CITC): very good (CITC $\geq$.40), good ($.30 \leq$ CITC $\leq$.39), marginal ($.20 \leq$ CITC $\leq$.29), and poor (CITC <.20) [21].

Mplus Software, version 8.0 (Muthén & Muthén, Los Angeles, CA, USA), with license no. STBML80006817 was used for structural equation modeling to perform the confirmatory factor analysis of the model. Goodness of fit indices criteria were used to evaluate the fitness of the model with the data. First was the absolute fit index: the normed Chi-square (χ^2/df) $\leq$3; root mean square error of approximation (RMSEA) < .07; standardized root mean square residual (SRMR) < .08. Second involved the incremental fit index: comparative fit index (CFI) > .90; Tucker–Lewis index (TLI) > .90 [22]. Third comprised the model comparison index: Akaike's information criteria (AIC) and Bayesian information criteria (BIC), wherein the model with a lower value indicated a better fit [23]. Criteria of subsets of construct validity such as the convergent validity exhibited item loading $\geq$.50, average variance extracted (AVE) > .50, composite reliability $\geq$.70, and the discriminant validity showed a correlation between constructs <.90, and AVE was higher than the square of correlation (r^2) between constructs [20,22].

Results

A total of 397 participants were aged 14–20 years, with an average age of 17.98 years (standard deviation = 1.39), whereas their infants' ages ranged from 4 to 12 months, with an average age of 7.59 months (standard deviation = 2.82). Approximately 80% of participants had attained secondary school level and were homemakers. A total of 69.0% had spouses and were living together, and more than one half of teenage mothers were living with their own family. 79.1% of participants reported unintentionally having an infant, and 59.4% reported inexperienced infant care, but they were major caretakers of their babies. In addition, more than one half spent time between 17 and 24 hours a day to take care of their babies. The majority (97.5%) had an infant care supporter, i.e., own mother (57.5%), their spouses (24.4%), etc., (Table 1). All the items of MIS showed slightly high mean scores ranging from 3.77 to 4.56 (Table 2).

MIS Validation and Reliability

Confirmatory factor analysis of the MIS was presented in both the primary and final models. The primary model showed that the overall model did not exhibit a good fit with the empirical data because CFI and TLI were less than .90. Therefore, the primary model was improved. The model was revised by specifying a model based on model modification indices. The covariance between errors associated among 5-pair items, exhibiting the highest values of modification indices, consisted of 1) a2 and a3, 2) c2 and c3, 3) g2 and g3, 4) g5 and g6, and 5) g9 and g10, so they were adjusted (Figure 1). After that, the final model provided an overall model fit well to the empirical data. CFI and TLI exceeded .90, the χ^2/df was 2.3, RMSEA and SRMR were less than .07. Moreover, AIC and BIC values were smaller than the values in the primary model, indicating that the final model was parsimonious and a better fitting model. The range from the minority to majority of R^2 values indicated about 33–66% of the variance among MIS items. This could be explained by three constructs of MI; item g9 of gratification in the role factor exhibited the highest power of explanation, whereas item a2 of attachment to the infant factor showed the lowest (Table 3).

Table 1 *Characteristics of Teenage Mothers and Infants (N = 397).*

Characteristics	Frequency	Percentage
Mother's age (yrs)		
Middle adolescence (14–17)	140	35.3
Late adolescence (18–20)	257	64.7
	Range	M ± SD
	14–20	17.98 ± 1.39
Infant's age (months)		
4–6	160	40.3
7–9	118	29.7
10–1 2	119	30.0
	Range	M ± SD
	4–12	7.59 ± 2.82
Educational attainment		
Primary school (Grade 1–6)	67	16.9
Secondary school (Grade 7–9)	297	74.8
High school (Grade 10–12)	33	8.3
Employment status		
Unemployed	317	79.8
Homemaker	*289*	*72.8*
Student	*28*	*7.0*
Employed	80	20.2
Marital status		
Couple living together	274	69.0
Couple not living together (separated)	81	20.4
Single (divorced/widowed)	42	10.6
Resident status		
Living with only her spouse	33	8.3
Living with own family	258	65.0
Living with spouse's family	106	26.7
Intentionally having an infant		
No	314	79.1
Yes	83	20.9
Experienced infant care		
No	236	59.4
Yes	161	40.6
Time to take care of their infants (hours)		
Part-time (less than 8)	63	15.9
Full-time (8–24)	334	84.1
Having infant care supporter		
No	9	2.5
Yes	344	97.5
Spouse	*86*	*24.4*
Own mother	*203*	*57.5*
Spouse's mother	*24*	*6.8*
Relatives	*23*	*6.5*
Health-care staff	*8*	*2.3*

Note. M ± SD = mean ± standard deviation; yrs = years.

Table 2 *Descriptive Statistics of Items of the Maternal Identity Scale (N = 397).*

Factors/Items	Min–Max	M ± SD
Attachment to the infant		
a1: Holding my baby closely is very important for me.	1–5	4.43 ± 0.75
a2: I know the meaning of each tone of my baby's voice.	1–5	3.77 ± 0.84
a3: I understand my baby's signals.	1–5	3.92 ± 0.77
a4: When my baby wants to sleep, I know.	1–5	4.19 ± 0.77
a5: I know what my baby feels or needs.	1–5	3.91 ± 0.79
a6: I speak in a gentle voice with my baby.	1–5	4.06 ± 0.78
Role competence		
c1: I can handle my baby's sleep following appropriate time.	1–5	4.01 ± 0.79
c2: I take care of my baby's hygiene correctly (e.g., bathing and shampooing).	2–5	4.14 ± 0.76
c3: I know how to dress my baby appropriating the weather.	1–5	4.29 ± 0.76
c4: I know the signs when he/she has illness and when he/she needs to see a doctor	1–5	4.41 ± 0.72
c5: I know what is dangerous to my baby.	2–5	4.31 ± 0.77
c6: I respond to my baby's needs correctly.	2–5	3.89 ± 0.76
c7: When my baby cries, I am good at soothing.	1–5	4.06 ± 0.77
c8: I provide enough milk or food for my baby appropriately and correctly methods.	1–5	3.84 ± 0.79
Gratification in the role		
g1: I feel happy when taking care of my baby by myself.	1–5	4.29 ± 0.77
g2: I feel happy when feeding my baby.	1–5	4.03 ± 0.95
g3: I feel satisfied taking responsibility for my baby.	2–5	4.18 ± 0.77
g4: My baby is a reward in my life.	1–5	4.43 ± 0.76
g5: I am happy to look after my baby's development.	1–5	4.51 ± 0.72
g6: I feel so proud when people appreciate my baby.	1–5	4.56 ± 0.72
g7: Taking care of my baby is my first priority.	2–5	4.28 ± 0.76
g8: I can do everything for my baby.	1–5	4.42 ± 0.77
g9: Going directly to my baby is the first that I do when coming home.	1–5	4.50 ± 0.67
g10: I feel in harmony and the maternal role is a part of my daily life	1–5	4.54 ± 0.66

Note. Max = maximum score; Min = minimum score; M ± SD = mean ± standard deviation.

In terms of the revised model, construct validity was revealed. First, regarding convergent validity, all item loadings were higher than .50, AVE of gratification in the role was higher than .50, and all composite reliability values were higher than .70. These were acceptable regarding the convergent validity criteria, whereas AVE of both constructs, i.e., attachment to the infant and role competence, lower than .50 did not support the criteria. Second, concerning discrimination validity, intercorrelations of constructs showed positive correlation ($.74 \leq r \leq .87$), acceptable according to the study criteria. However, three constructs had AVE values lower than r^2 estimates ($r^2_{Atta.Comp} = .76$, $r^2_{Atta.Grat} = .55$, and $r^2_{Comp.Grat} = 0.59$), not supporting the criteria (Figure 1 and Table 3). Reflecting the classical test theory, the value of each item discrimination, CITC ranging from .52 to .70, was at a very good level. In addition, the overall Cronbach's α coefficient was .95 at an excellent level, and Cronbach's α coefficients of three subscales ranged from .82 to .92 (Table 3).

Discussion

All items of MIS showed slightly high mean scores; this could be because 64.7% participants were late adolescents and 74.8% completed grade 7- to 9-education, which led to them having the ability to form MI adapting better than those of younger age and having lower educational attainment. Moreover, they were at an average 7.59 months postpartum or having about 8–10 months of caretaking experience. In addition, 79.8% of them were unemployed and full-time taking care of their infants, and some could achieve MI adapting at four months as well as Mercer's theory indicated. Also, most (97.5%) had helpers who supported infant care and were residing with extended family. Regarding Thai culture, the extended family is considered a big support from relatives. Moreover, 69.0% were living together with their spouse, who were considered as a significant facilitator of MI development process as Mercer's theoretical framework suggested. Possibly the participants reported high mean scores.

The present study revealed the revised model fit well to the empirical data. The findings showed that all fit indices met the study criteria, indicating the MIS was more reliable than the original and previous scales [15,18], although overall construct validity of MIS in the final model proved accepted criteria regarding Kline [20] and Hair et al [22]. However, AVE values of both constructs, i.e., attachment to the infant and role competence, exhibited lower than the criteria, and three constructs revealed AVE values lower than r^2 estimates, indicating slightly little convergent validity and discriminant validity of MIS, in that order. These findings could be described using Mercer's MI development process. The MI develops since pregnancy and is attained at around 4 months postpartum, following four stages (*a* through *d*), i.e., ***a*** *stage*, commitment and attachment to the unborn baby during pregnancy; ***b*** *stage*, attachment and physical restoration during the first 2–6 weeks after birth; ***c*** *stage*, moving toward a new normal during two weeks to four months after delivery; ***d*** *stage*, achievement of maternal identity through redefining self to incorporate motherhood (around four months after delivery) by a woman integrates mothering into her self-system, internalizes the role, and views herself as a competent mother. The MI develops in a step-by-step manner, and each step could be corrected interacting with each other [1,3]. Mothers who interacted with their infants and display attachment to the infant (pregnancy and peaking at three months postpartum) would be able to develop, exhibit, and fulfill their role competently (peaking at four months postpartum), revealing satisfaction in the maternal role (peaking at four months postpartum). Mercer also indicated that attachment and competence were positively and strongly correlated [1]. However, in this study, two factors, attachment and competence, did not combine together because they differed in the definition of MI regarding Mercer's theory. Importantly, the MIS was intensely considering these three constructs.

Furthermore, the results showed Cronbach's α coefficient was at adequate to excellent reliability level using Kline criteria [20]. The MIS was found to have stronger reliability than related studies. The original MRAS-Form B reliability was .89 [14], and related studies by Jeenmuang et al [16] Thammarat et al [18], Krongrawa [15], and Pakdewong [17] reported α coefficients of .86, .87, .89, and .92, respectively. Moreover, all CITC values showed positive correlation greater than .30, representing a good degree of the MIS items that were able to discriminate a good ability group from a low ability group among participants [21]. These findings supported the classical test theory.

Strengths

This study confirmed the structure of the MIS using confirmatory factor analysis technique. Mostly, goodness of fit indices accepted all items fit to the empirical data. These indicated that the MIS was appropriate for primiparous teenage mothers at 4- to 12-month postpartum period. This research study was conducted using a large sample, and data were obtained through the researcher and researcher assistants comprising home health-care staff. Therefore, the MIS was acceptable to be used to assess MI of Thai adolescent mothers at community. Moreover, the MIS offers a low

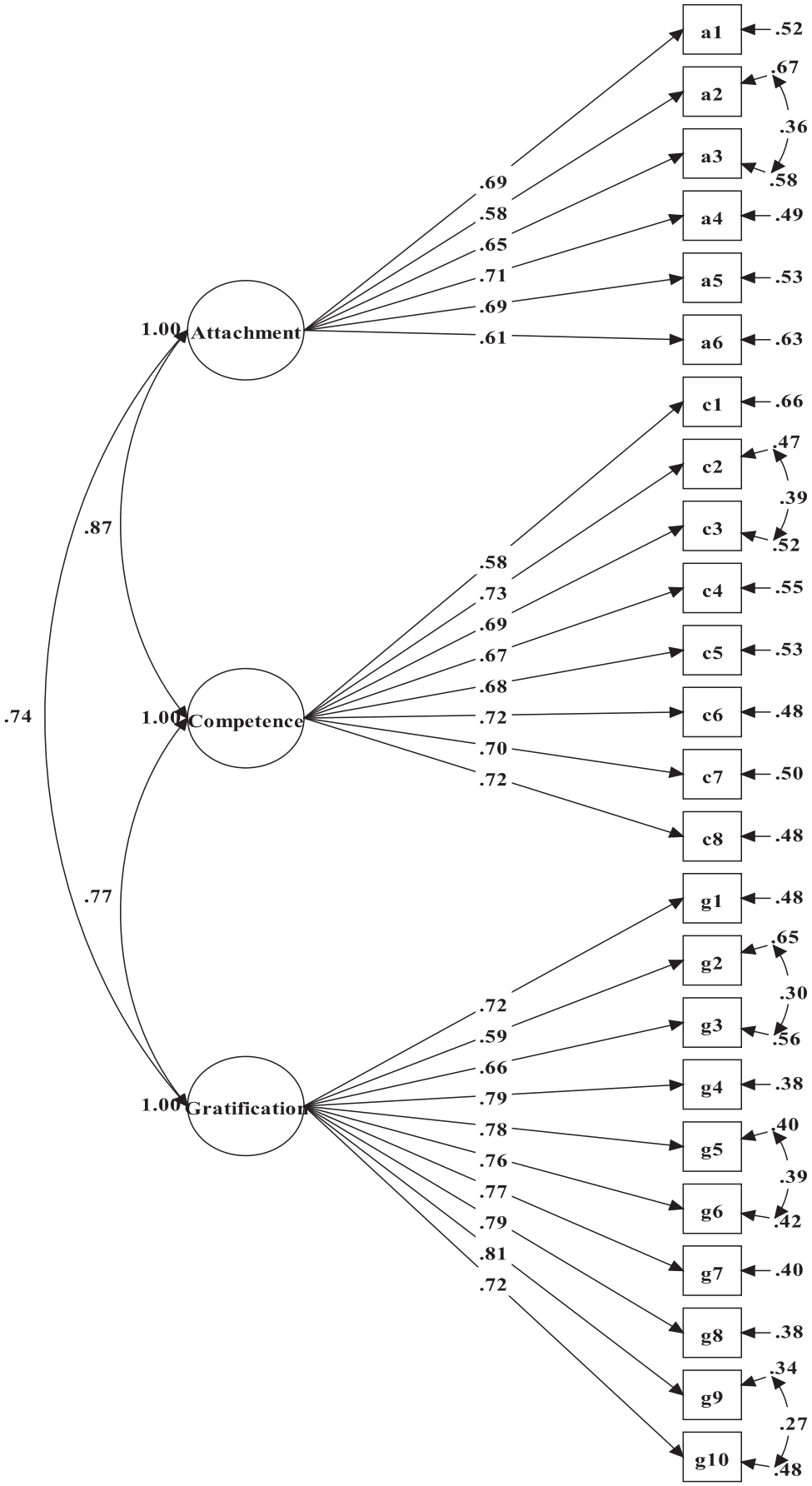

Figure 1. Final model of the maternal identity scale. *Note*. Attachment = attachment to the infant; Competence = role competence; Gratification = gratification in the role.

Table 3 *Validation, Reliability, and Fit Indices of the Maternal Identity Scale (N = 397).*

Items	Confirmatory factor analysis				Classical test theory	
	Primary model		Final model		Item discrimination (CITC)	Alpha if item deleted
	Loadings[a]	R^2	Loadings[a]	R^2		
Attachment to the infant: AVE = .44, CR = .82					Cronbach's α = .82	
a1	.68	.46	.70	.48	.66	.94
a2	.62	.39	.58	.33	.52	.95
a3	.69	.47	.65	.42	.59	.94
a4	.71	.51	.71	.51	.60	.94
a5	.69	.47	.69	.47	.60	.94
a6	.60	.36	.61	.37	.54	.95
Role competence: AVE = .48, CR = .88					Cronbach's α = .88	
c1	.59	.35	.58	.34	.52	.95
c2	.77	.59	.73	.53	.65	.94
c3	.74	.54	.70	.48	.66	.94
c4	.68	.46	.67	.45	.62	.94
c5	.68	.47	.68	.47	.61	.94
c6	.72	.51	.72	.52	.65	.94
c7	.69	.47	.71	.50	.65	.94
c8	.70	.49	.72	.52	.67	.94
Gratification in the role: AVE = .54, CR = .92					Cronbach's α = .92	
g1	.71	.51	.72	.66	.66	.94
g2	.59	.34	.59	.56	.56	.95
g3	.66	.44	.66	.66	.66	.94
g4	.79	.62	.79	.70	.70	.94
g5	.80	.64	.78	.70	.70	.94
g6	.79	.62	.76	.70	.70	.94
g7	.77	.60	.77	.70	.70	.94
g8	.78	.62	.80	.66	.66	.94
g9	.82	.68	.81	.70	.70	.94
g10	.74	.55	.72	.65	.65	.94
Correlation between factors					Overall Cronbach's α = .95	
Attachment and competence	.86	.87				
Attachment and gratification	.72	.74				
Competence and gratification	.75	.77				
Fit indices						
χ^2/df	2.83	2.23				
CFI	.89	.93				
TLI	.88	.92				
RMSEA	.07	.06				
SRMR	.05	.05				
AIC	17191.16	16985.15				
BIC	17489.96	17303.86				

Note. [a] = loadings of all items were significant at $p < .001$; χ^2/df = the normed chi-square; AIC = Akaike's information criteria; AVE = average variance extracted; BIC = Bayesian information criteria; CFI = comparative fit index; CITC = corrected item-total correlation; CR = composite reliability; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; TLI = Tucker–Lewis index.

cost and convenient method available for health-care staff and social workers working at primary health-care units. Adolescent mothers not meeting successful MI adapting could be offered practical and helpful information. In addition, those who engaged in the MI practices could be promoted and encouraged more effectively. The MIS serves as a window of opportunity to prevent maternal role problems and promote MI in the early postpartum period.

Limitations and Recommendations

Only a self-administered questionnaire was used among primiparous Thai teenage mothers, and the participants' follow-up was short because this constituted a cross-sectional study. The MIS was evaluated in 4- to 12-month period postpartum, which was too wide. Therefore, further validity and stability testing of the MIS were recommended, e.g., using different settings, creating online MIS form, conducting a longitudinal studying, etc. Moreover, regarding mean scores, MIS had slightly high scores among participants 4–12 months postpartum, and further study should apply a self-administered questionnaire together with MI performance testing and compare mean scores of MIS follow-up at differing infant's ages, e.g., at 4, 8, and 12 months or among other mothers, e.g., primiparous teenage mothers having and not having her spouse, etc. The last suggestion for further study is that MIS should be needed to prove construct validity again because the convergent and discriminant tests of MIS were not acceptable.

Conclusion

The result of this study indicated that MIS could be used to assess achieving MI among primiparous teenage mothers between 4 and 12 months after childbirth. The MIS could be widely used in community settings, and nurses and postpartum health-care staff should use the MIS to assess MI regularly.

Conflicts of interest

The authors declared no conflict of interest.

Acknowledgments

The authors are grateful to the primiparous teenage mothers in the study areas for their valuable participation. This study was financially supported by the National Research Council of Thailand, Thailand (FY2018 Thesis Grant for Doctoral Degree Students), and

partially supported for publication by Faculty of Public Health, Mahidol University, Bangkok, Thailand.

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