의사결정나무 분석기법을 이용한 청소년의 인터넷게임 중독 영향 요인 예측 모형 구축

김기숙[1] · 김경희[2]

[1]   ,[2]

A Prediction Model for Internet Game Addiction in Adolescents: Using a Decision Tree Analysis

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Purpose: This study was designed to build a theoretical frame to provide practical help to prevent and manage adolescent internet game addiction by developing a prediction model through a comprehensive analysis of related factors. **Methods:** The participants were 1,318 students studying in elementary, middle, and high schools in Seoul and Gyeonggi Province, Korea. Collected data were analyzed using the SPSS program. Decision Tree Analysis using the Clementine program was applied to build an optimum and significant prediction model to predict internet game addiction related to various factors, especially parent related factors. **Results:** From the data analyses, the prediction model for factors related to internet game addiction presented with 5 pathways. Causative factors included gender, type of school, siblings, economic status, religion, time spent alone, gaming place, payment to Internet café, frequency, duration, parent's ability to use internet, occupation (mother), trust (father), expectations regarding adolescent's study (mother), supervising (both parents), rearing attitude (both parents). **Conclusion:** The results suggest preventive and managerial nursing programs for specific groups by path. Use of this predictive model can expand the role of school nurses, not only in counseling addicted adolescents but also, in developing and carrying out programs with parents and approaching adolescents individually through databases and computer programming.

Key words: Addiction, Adolescent, Attitude, Decision tree, Internet

서 론

1. 연구의 필요성

2009   12   76.3% 3,619
,   8

(Korea Internet & Security Agency [KISA], 2009).

94. 1%,   97.5%,   99.1%

(Korea Agency for Digital Op-
portunity & Promotion [KADO], 2007).

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, , , ,

, .

(Lee, 2003).

2. 연구 목적

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(Ahn & Lee, 2002; Song & .
Sim, 2003). ,

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2000 , - , , ,

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(Kheirkhan, .
Juibary, Gouran, & Hashemi, 2008; Mitchell, 2000), ,

, , , , .

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, ## 연구 방법

,

(Kwon, 2005; ## 1. 연구 설계
Ryu, 2003).

, ,

.
(Kim, Son, Yang,
Cho, & Lee, 2007; Rae- Grant, Thomas, Offrod, & Bolyle, ## 2. 연구 대상
1989).

,
(Lim & , · .
Lee, 2002), · 4 4, 5, 6 694
6 · 624 1,318 .

(Kim, 2008). ## 3. 자료 수집 방법

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331 , 3 293
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,   .

.   2008   6   7   2

1,501

.   1

1,318   .

4. 연구 도구

1) 인터넷게임 중독

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,

,

KADO (2006)   ,

(9 - 12)

(13- 18)

, KADO   .

20   4   ,   '

' 1 ;   ' 2 ;   ' 3 ;

' 4   .

20- 35   , 36- 45

, 46- 80   20-

37   , 38- 48   ,

49- 80   .

Cronbach's α=.90   ,   Cronbach's α=

.93   .

Cronbach's α=.92   , ·   Cron-

bach's α=.93   .

2) 부모−자녀 애착

-

(Bowlby, 1969),

Armsden   Greenberg (1987)   '

'(Inventory of Parent and Peer attachment: Moth-

er, Father, and Peer Version [IPPA- R])   .

The Pennsylvania State University   Dr. Green-

berg

.   Ok (1998)

2   .   .

,   ,

. IPPA- R   25   5

(10   ),   (9   ),   (6   )   3

.   '   /

,

6   4

.   '   ' 1 ;   ,

2 ;   ' 3 ;   ' 4 ;   '

5   ,

.

Armsden   Greenberg (1987)   -

Cronbach's α=.87,   -   Cronbach's

α=.89   ,   ,   -

Cronbach's α .76   .77   .

-                            ,   ,

,   ,

.   9- 25 ,

26- 33 ,   34- 45

10- 34 ,   35- 41 ,   42- 50

,   6- 22 ,   23- 26 ,

27- 30   .   9- 27 ,

28- 35 ,   36- 45

10- 35 ,   36- 42 ,   43- 50 ,

6- 22 ,   23- 26 ,   27-

30   .

yes/no

2

,

.

3) 부모의 학업기대

,   Ryu (2003)

'   '   7

.   5   '

' 1 ' 5 ,

. Ryu (2003) Cronbach's α=.85 ,

Cronbach's α=.87,

.85 .

, ,

. 7- 24 ,

25- 28 , 29- 35

7- 24 , 25- 29 , 30- 35

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4) 부모의 감독

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,

(Korea Institute of

Criminology [KIC], 1995), KIC (1995)

Kim (2006) , . 4

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. ' ' 1 '

' 5 . Kim (2006) Cron-

bach's α=.83 ,

Cronbach's α=.89, .86 .

, ,

. 4-

10 , 11- 13 , 14- 20 ,

4- 11 , 12- 15 , 16- 20

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5) 부모의 양육태도

, ,

Rohner Rohner (1981) " Parental Accept-

Rejection Questionaire (PARQ)" Kwon (2005)

. 5 18

, ' ,

1 ;' ' 2 ;' ' 3 ;'

' 4 ;' ' 5 .

, ,

. Kwon (2005) Cron-

bach's α=.84 Cron-

bach's α=.87, .85 .

(,), , (,

) .

19- 63 , 64- 74 , 75- 90 ,

22- 64 , 65- 74 ,

75- 90 .

5. 자료 분석 방법

SPSS .

.

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$p<$.05 ( ) .

,

(Deci-

sion Tree Analysis) .

CHAID (Chi- squared

Automatic Interaction Detector), CART (Classification and

Regression Trees), C 5.0 (Choi et al., 2002),

SPSS Cle-

mentine 8.1 C 5.0

.

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,

5:3:2 Balancing .

Balanc-

ing

.

(Decision Tree Analysis)

(Decision rule)

(classification)

(prediction) .

(node)

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3. 부모관련 요인과 인터넷게임 중독

연구 결과

34 (57.6%)
(χ^2=22.25, p<.001),

1. 대상자의 일반적, 인터넷게임 관련 특성, 인터넷게임 중독

51.7%,   48.9%

52.7%,   25.1%   22.2%   .

89.3%   ,   89.8%   32 (54.2%)   (χ^2=41.54, p<.001),

60.5%   ‘   ’   29 (49.2%)

63.8%, 76.0%   .   (χ^2=43.38, p<.001).   ‘   ’

24.1%   ‘   ’   .   24 (40.7%)   (χ^2=18.83, p=.001),

70.5%   (86.6%)   28 (47.5%)

1   6- 7   17.3%   .   (χ^2=23.53, p<.001).   ‘   ’   36

85%,   10.1%,   4.5%   (61.0%)   (χ^2=57.20, p<.001),

.   ‘   ’   33 (55.9%)   (χ^2=57.42, p<

.001).   31 (52.5%)

2. 일반적 특성 및 인터넷게임 관련 특성과 인터넷게임 중독

(χ^2=34.31, p<.001),

.05

24 (42.4%)   (χ^2=29.66, p<.001).

50   , 84.7%

30 (50.8%)

(χ^2=55.72, p<.001),   (   )

(χ^2=32.15, p<.001),

39 (66.1%)   (χ^2=9.67 p=.046).

25 (42.4%)

47 (79.7%) (χ^2=7.68, p=.022),

(χ^2=44.02, p<.001).   -

41 (69.5%)   (χ^2=25.34,

33 (55.9%)   (χ^2=57.09, p<.001),

p<.001).   ‘   ’   16 (27.1%)

-

(χ^2=22.34, p=.004),

31 (52.5%)   (χ^2=69.90, p<

.001) (Table 2).

49 (83.1%)   (χ^2=16.77, p=.033),

4. 청소년의 인터넷게임 중독 예측모형

1   1   ,

32 (54.2%)   (χ^2=139.75, p<.001), 1

,   ,   ,   ,   ,

6- 7   37 (62.7%)

,   (   ),   (   ),   (   ),   (   ),   (   ),

(χ^2=168.20, p<.001),

(   ),   (   ),   .

1- 2   , 3   20 (33.9%)

(Clementine) 8.1

(χ^2=206.99, p<.001) (Table 1).

Figure 1   .

Table 1. Internet Game Addiction According to General and Internet Game Characteristics (N=1,318)

Variables	Classification	IGA n (%)			χ^2	p
		GU	PRU	AU		
Gender	Male	536 (47.6)	96 (72.2)	50 (84.7)	55.72	<.001
	Female	590 (52.4)	37 (27.8)	9 (15.3)		
Type of school	Elementary	585 (52.0)	70 (52.6)	39 (66.1)	9.67	.046
	Middle	277 (24.6)	40 (30.1)	14 (23.7)		
	High	264 (23.4)	23 (17.3)	6 (10.2)		
Siblings	Have	1,019 (90.5)	117 (88.0)	47 (79.7)	7.68	.022
	None	107 (9.5)	16 (12.0)	12 (20.3)		
Economic status	Good	185 (16.4)	12 (9.0)	7 (11.9)	25.34	<.001
	Moderate	862 (76.6)	99 (74.4)	41 (69.5)		
	Poor	79 (7.0)	22 (16.5)	11 (8.6)		
Religion	Have	692 (61.5)	78 (58.6)	27 (45.8)	5.98	.050
	None	434 (38.5)	55 (41.4)	32 (54.2)		
Time alone (w/o parents)	Very little	329 (29.2)	25 (18.8)	9 (15.3)	22.34	.004
	Little	234 (20.8)	30 (22.6)	9 (15.3)		
	Moderate	307 (27.3)	42 (31.6)	16 (27.1)		
	Much	157 (13.9)	18 (13.5)	13 (22.0)		
	Very much	99 (8.8)	18 (13.5)	12 (20.3)		
Place where adolescence play	Home	986 (87.6)	106 (79.7)	49 (83.1)	16.77	.033
	Internet cafe	77 (6.8)	20 (15.0)	7 (11.9)		
	Others	59 (5.6)	9 (5.3)	5 (5.1)		
Payment (Internet cafe, won/week)	<5,000	249 (22.1)	55 (41.4)	13 (22.0)	139.75	<.001
	≤5,000, >10,000	26 (2.3)	16 (12.0)	8 (13.6)		
	≥10,000	10 (0.9)	6 (4.5)	6 (10.2)		
	None	841 (74.7)	56 (42.1)	32 (54.2)		
Frequency (day/week)	1	400 (35.5)	18 (13.5)	3 (5.1)	168.20	<.001
	2-3	391 (34.7)	35 (26.3)	12 (20.3)		
	4-5	198 (17.6)	26 (19.5)	7 (11.9)		
	6-7	137 (12.2)	54 (40.6)	37 (62.7)		
Duration (hr/one time)	<1	443 (39.3)	16 (12.0)	6 (10.2)	206.99	<.001
	≤1, below 2	475 (42.2)	39 (29.3)	20 (33.9)		
	≤2, below 3	172 (15.3)	52 (39.1)	13 (22.0)		
	>3	36 (3.2)	26 (19.5)	20 (33.9)		

IGA=Internet game addiction; GU=General user; PRU=Potential risk user; AU=Addicted user.
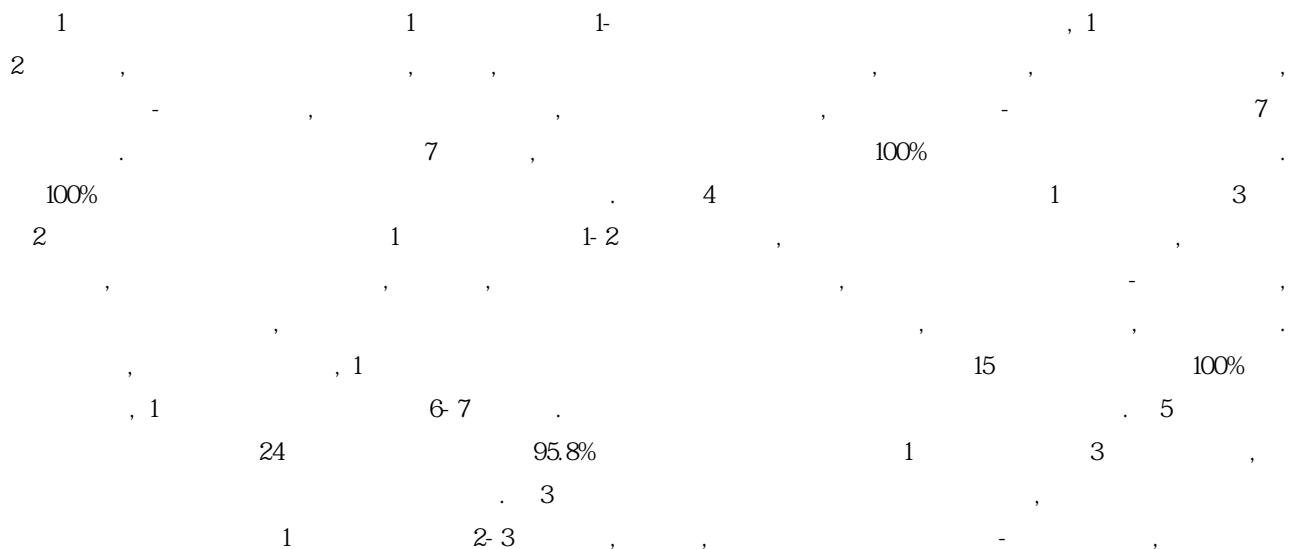
Table 2. Internet Game Addiction According to Parents related Factors   (N=1,318)

Variables			Classification	IGA n (%)			χ^2	p
				GU	PRU	AU		
PAI			Only father	152 (13.5)	25 (18.8)	7 (11.9)	22.25	.001
			Only mother	82 (7.3)	14 (10.5)	12 (20.3)		
			Both	805 (71.5)	78 (58.6)	34 (57.6)		
			Nobody	87 (7.7)	16 (12.0)	6 (10.2)		
Occupation		Father	Regular	977 (86.8)	106 (79.2)	49 (83.1)	6.34	.175
			Irregular	122 (10.8)	22 (16.5)	7 (11.9)		
			None	27 (2.4)	5 (3.8)	3 (5.1)		
		Mother	Regular	511 (45.4)	62 (46.6)	29 (49.2)	7.81	.099
			Irregular	134 (11.9)	22 (16.5)	12 (20.3)		
			None	481 (42.7)	49 (36.8)	18 (30.5)		
Attachment	Trust	Father	Low	331 (29.4)	57 (42.9)	32 (54.2)	41.54	<.001
			Middle	350 (31.1)	52 (39.1)	18 (30.5)		
			High	445 (39.5)	24 (18.0)	9 (15.3)		
		Mother	Low	336 (29.8)	62 (46.6)	29 (49.2)	43.38	<.001
			Middle	355 (31.5)	51 (38.3)	21 (35.6)		
			High	435 (38.6)	20 (15.0)	9 (15.3)		
	Communication	Father	Low	325 (28.9)	43 (32.3)	22 (37.3)	18.83	.001
			Middle	378 (33.6)	61 (45.9)	24 (40.7)		
			High	423 (37.6)	29 (21.8)	13 (22.0)		
		Mother	Low	324 (28.8)	53 (39.8)	28 (47.5)	23.53	<.001
			Middle	375 (33.3)	52 (39.1)	15 (30.5)		
			High	427 (37.9)	28 (21.1)	16 (15.3)		
	Alienation	Father	Low	440 (39.1)	22 (16.5)	6 (10.2)	57.20	<.001
			Middle	351 (31.2)	45 (33.8)	17 (28.8)		
			High	335 (29.8)	66 (49.6)	36 (61.0)		
		Mother	Low	487 (43.3)	23 (17.3)	9 (15.3)	57.42	<.001
			Middle	320 (28.4)	46 (34.6)	17 (28.8)		
			High	319 (28.3)	64 (48.1)	33 (55.9)		
ERS		Father	Low	331 (29.4)	64 (48.1)	31 (52.5)	34.31	<.001
			Middle	319 (28.3)	37 (27.8)	12 (20.3)		
			High	476 (42.3)	32 (24.1)	16 (27.1)		
		Mother	Low	293 (26.0)	60 (45.1)	24 (42.4)	29.66	<.001
			Middle	411 (36.5)	43 (32.3)	20 (33.9)		
			High	422 (37.5)	30 (22.6)	14 (23.7)		
Supervising		Father	Low	343 (30.5)	54 (40.6)	30 (50.8)	32.15	<.001
			Middle	307 (27.3)	50 (37.6)	16 (27.1)		
			High	476 (42.3)	29 (21.8)	13 (22.0)		
		Mother	Low	253 (22.5)	44 (33.1)	25 (42.4)	44.02	<.001
			Middle	402 (35.7)	64 (48.1)	25 (42.4)		
			High	471 (41.8)	25 (18.8)	9 (15.3)		
Nurturing attitude		Father	Low	317 (28.2)	68 (51.1)	33 (55.9)	57.09	<.001
			Middle	393 (34.9)	46 (34.6)	18 (30.5)		
			High	416 (36.9)	19 (14.3)	8 (13.6)		
		Mother	Low	320 (28.4)	76 (57.1)	31 (52.5)	69.90	<.001
			Middle	384 (34.1)	42 (31.6)	20 (33.9)		
			High	422 (37.5)	15 (11.3)	8 (13.6)		

IGA=Internet game addiction; GU=General user; PRU=Potential risk user; AU=Addicted user; PAI=Parent's ability to use Internet; ERS=Expectation regarding adolescent' study.

, 1   **5. 예측모형의 평가**

5   15   100%

.   (misclassification rate)
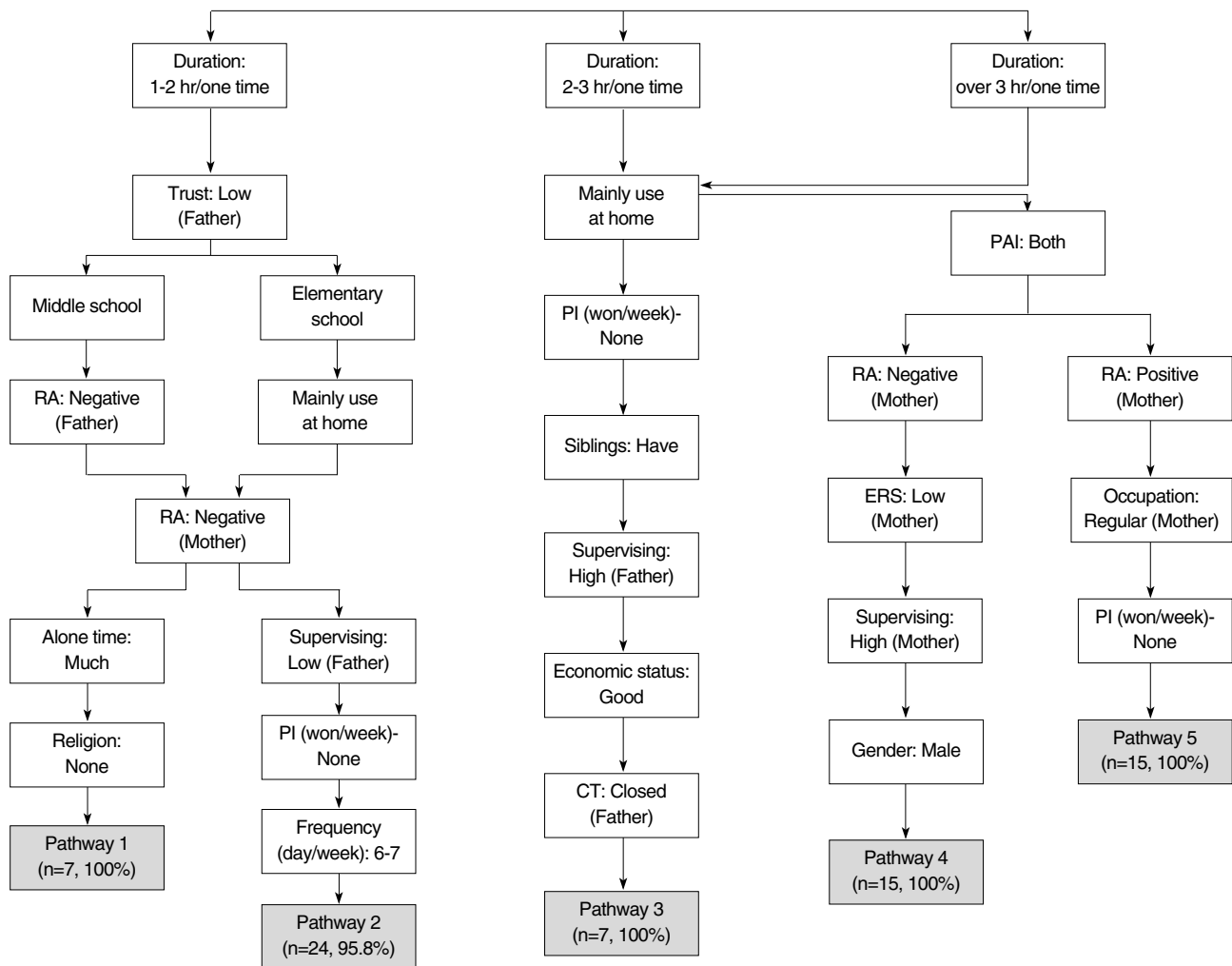
Figure 1. Predictive Model for Internet Game Addiction in Adolescence.
RA=Rearing attitude; PI=Payment to Internet cafe; CT=Communication type; ERS=Expectation regarding adolescent' study; PAI=Parent's ability to use Internet.

Table 3. Accuracy of the Predictive Model for Internet Game Addiction in Adolescence

Classification		Experienced n (%)		
		GU	PRU	AU
Predictive model	GU	1,082	32	12 (2.7)
	PRU	10	667	0 (0.0)
	AU	0	0	444 (97.3)

GU=General user; PRU=Potential risk user; AU=Addicted user.

논 의

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Kwon (2005)

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97.3%   0.027   .

444   (97.3%)   , 12   (2.7%)   2

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(Table 3).

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　Kim　Kim (2009)   Jo   '   '， '
Bang (2003)   ，

．　．   ，　　　　Kim

(2007)

．

2003　1,118   2009

．   1,552   6   38%

90%　PC   (KISA, 2009) PC

(Kwon, 2005).   ，

．   Kim   (2007)

，

．　，　·　·   Jo　Bang (2003)   '   6- 7 '

．

，Ryu (2003)   3

3   (Kwon, 2005)

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　Kwon (2005)   ．   -   -   ，

(Jo & Bang, 2003).

-

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2   4   ，

66. 1%

2000   Ryu (2003)   ，

Suh　Lee (2007)

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，

(Kim, Lee, Woo, Jo, & Kweon, 2002),   (Jang, 2005)

(Nam & Kim, 2000)   ，-

．   ．

Kim (2006)

결론 및 제언

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