Predicting Factors on Modeling Health Behavior: A Systematic Review

by Dr. Michael Lemon Et Alia

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Objectives: In this study, we summarize current evidence on learning health behaviors through modeling, thereby offering greater insight into the predictors of modeling's effectiveness on health behavior change. **Methods:** We searched 5 electronic bases (PubMed, ProQuest New Platform, EBSCOHost, ERIC, and ScienceDirect) drawing on articles from January 1986 to April 2018. In addition, we performed follow-up searches of unique citations from identified articles. **Results:** Overall, our search identified 3339 articles. Based on inclusion and exclusion criteria, we reviewed 20 qualifying articles across 4 conditions of role modeling: *attention*, *retention*, *motor reproduction*, and *motivation*. Characteristics of role models and observers, use of technology to promote the modeling of health behavior, and use of peers as role models emerged as predictive factors related to *attention*; types of information and adherence to a specific timeframe were related to *retention*. Opportunity to practice a modeled health behavior and a specific timeframe to perform what was observed were key elements for *motor reproduction*. Support by significant others, self-efficacy, self-regulation, and policy incentives were predictive of sustained *motivation*. **Conclusions:** This review highlights several predictive factors in each situation in learning healthy behavior through role modeling. Identification and application of these factors may increase health behavior adoption.

Health behavior has been defined as "any activity undertaken by a person believing himself to be healthy for preventing disease or detecting it at an asymptomatic stage."[1] There are limitations to this concept because not all people carry out health behaviors for these purposes. For example, a person with a chronic disease may engage in health behaviors to prevent further physiological damage from the illness they experience. In addition, through engaging in specific health behaviors (eg, healthy diet and exercise), people increase their self-esteem by having an attractive physical appearance. The presence of variations in people's goals for selecting healthy behavior led to the development of a broader definition of health behavior. Conner and Norman[2,3]

defined health behavior as any activity undertaken to prevent or detect disease to improve health and well-being. Cockerham[4] described health behavior as the activity undertaken by people to maintain or enhance their health, prevent health problems, or achieve a positive body image.

Furthermore, evolution of a health behavior definition occurred because health behaviors result not only from personal factors, eg, health beliefs, self-efficacy,[5] but also from strong environmental influences. Expanding on other social learning models, Bandura,[6] in his social cognitive theory, explained the influence of both personal and environmental factors on behavior in his concept known as reciprocal determinism. Personal factors that influence health behavior include economic reasons,[7-11] and

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environmental factors include the availability of facilities that support healthy behavior,[12] as well as societal norms that regulate people's conduct of health behaviors,[13,14] and the presence of other people as role models for practicing health behavior.[15] In the developmental dynamics of social interactions and cognitive processes, these dominant factors facilitate or impede the performance of health behaviors.[16]

A role model who is practicing a health behavior could be effective in encouraging others to make health behavior changes[5,17] because imitating behavior is an instinct that humans learn early in life.[18-20] The indirect learning process, known as modeling, is further explained in Bandura's social cognitive theory.[6] In modeling, 4 conditions are necessary before an individual can model someone else's behavior successfully. Based on this theory, these 4 modeling conditions include *attention*, *retention*, *motor reproduction*, and *motivation*. To learn what is modeled, people first must observe it, create a mental representation of it, reproduce what was modeled while monitoring their performance, and motivate the self to sustain the behavior. Whereas simply observing, imitating, and mimicking a model does not ensure success, recognizing the potential factors related to these 4 conditions helps improve understanding of how modeling more effectively leads to health behavior change.

Numerous studies have been conducted on health behavior change through modeling,[21-23] but only a few of these describe a specific modeling-learning theory. The main challenge remains on how to increase the effectiveness of modeling for health behavior change. The absence of a systematic review to classify potential factors related to these 4 modeling conditions creates difficulties in building a robust theoretical framework that illuminates the predictors of health behavior change through modeling. Accordingly, we conducted a systematic review to summarize current evidence concerning specific approaches to learning health behavior through that which is modeled. We aimed to explore the potential factors related to the 4 conditions to increase modeling's effect on health behavior change. We hope that this study can initiate deeper learning about the relationship between modeling and health behavior change.

METHODS
Search Strategy and Selection Criteria

We used 5 databases – PubMed, ProQuest New Platform, EBSCOHost, ERIC, and ScienceDirect, examining the literature from January 1986 to April 2018. We used *learning*, *role modeling/role modeled/role models*, *social cognitive theory/cognitive, social theory*, *health behavior*, *health risk behavior/risky health behaviors,* and *health behavior change* as the key search terms. The complete search strategy is shown in Appendix 1. We also used medical education and medical teacher databases and several online registries of theses and dissertations, ie, open access theses and dissertation (http://oatd.org), available theses (www.openthesis.org), British library Ethos (e-theses online service) (https://ethos.bl.uk/Home.do), and electronic theses and dissertations of Universitas Gadjah Mada (lib.ugm.ac.id/ind/). We conducted the literature searches during May and June 2018. Hand searches also were done by following up the reference lists of relevant book chapters and additional pertinent references. Figure 1 illustrates the flow diagram of the complete investigation.

In our initial search, criteria included all literature relating to modeling healthy behavior; we excluded studies that reported modeling of health risk behavior. We included only studies that were written in English. Editorials, essays, and other systematic reviews were excluded from our review. We did not restrict research context, population, and study design. From papers concerning modeling health behavior published recently, we aimed to identify the potential factors, categorized as the predictors in the 4 modeling conditions (attention, retention, motor reproduction, and motivation).

Data Extraction and Quality Assessment

The first author (MAL) independently conducted a computerized search and reviewed all titles. This process was checked by the second author (MC). Relevant abstracts were then screened independently by MAL and MC to identify studies that fit the inclusion criteria. The full articles were evaluated by 2 reviewers (MAL and MC) if a decision could not be made based on the titles and abstracts. We resolved any disagreements through discussion and consensus; if no agreement could be reached, we involved the third author (GRR). Relevant data were extracted by 2 reviewers (MAL and MC) using a standardized form developed before the study and cross-checked. The extracted data included

study characteristics (eg, date of publication, study type), participant characteristics, interventions, outcomes, and author conclusions. When publications lacked sufficient detail for full data extraction, we contacted the original authors to acquire the necessary information.

The quality of each research article was assessed independently by 2 authors (MAL and MC). We used the Best Evidence Medical Education (BEME) extraction sheet validated by BEME Review on Education Portfolios.[24] MAL and MC conducted an initial pilot test using a data extraction sheet (Appendix 2). Each author reviewed the same paper, which was randomly selected from included studies. Based on that pilot test, no changes to the data extraction sheet were considered necessary. The pilot-test results were then reviewed by MAL, MC, and GRR for their opinions on the data extraction sheet's suitability. This extraction sheet included 11 quality indicators relating to the study design's appropriateness, results, analysis, and conclusions. Higher-quality studies were considered to be those that met a minimum of 8 of these quality indicators; medium-quality studies met 6 or 7 criteria, and low scoring studies met ≤ 5 of the requirements.

Next, MAL and MC independently reviewed the full articles to determine which studies met our inclusion criteria. The study's appraisal was conducted by scoring each article section based on explicit information contained in the full text by using a data extraction sheet. Two authors (MAL and MC) met to discuss and agree on the decisions. We resolved any disagreements through discussion and consensus, involving a third author (GRR), if needed. To ensure that the abstraction quality was maintained, several studies were separately abstracted by GRR. Where a discrepancy was encountered, further discussion occurred ensure that the work remained focused.

Data Synthesis

We used the narrative analysis method to retrieve relevant information from each article to fulfill our research purpose. MAL and MC coded the extracted information about the potential factors related to the 4 conditions of modeling. Coding differences were resolved through discussion. The potential factors were then categorized into the 4 conditions in modeling. These potential factors were then debated and distilled by all authors and summarized by MAL. All authors were involved establishing the conceptual framework. These findings were then integrated into narrative structure and drafted by MAL. The information from all data extraction sheets is summarized and presented in Appendix 3 which can be accessed at http://bit.ly/Appendix3MAL.

RESULTS

We identified 3339 records, from which 64 potentially eligible articles were reviewed in full-text. Of these, 44 were excluded because they documented the modeling of health risk behavior (N = 10) or showed compliance with a behavior because of health policy implementation (ie, regulation) without modeling (N = 34). There were 20 eligible studies selected for inclusion in our review. Figure 1 is a PRISMA flow diagram that details the literature search process.

Quality and Characteristics of Included Studies

Nine studies focused on physical activity,[21,23,25-31] 2 on smoking cessation,[32,33] 6 on eating behavior,[14,34-38] one on sexual behavior,[39] and 2 on combinations of health behaviors, ie, nutrition, exercise and sun protection[40] and physical activity and eating behavior.[41] The predominant inquiry method used in those studies was mixed methods. Only 6 of 20 studies conducted an intervention. Of the included studies, 8 used questionnaires, 4 used interviews, and 8 used mixed methods (including an interview, focus group, survey, and observation or questionnaire and pedometer measurement).

Only 6 of the 20 studies[25,29,30,33,36,39] mentioned social cognitive theory, and 4 of 20 papers[21,36,37,39] used a role model in the study. The largest percentage of articles (35%; N = 7) were from the United States (US), but there was a broad international representation with articles from Canada, New Zealand, the United Kingdom, Denmark, Switzerland, Australia, Chile, Brazil, and China. All selected articles were published between 2000 and 2018. The included studies' quality assessments showed 19 were high-scoring articles, and one was a medium-scoring article; these results are described in Appendix 3 accessed at http://bit.ly/Appendix3MAL.

Figure 1
Flow Diagram of the Search Process
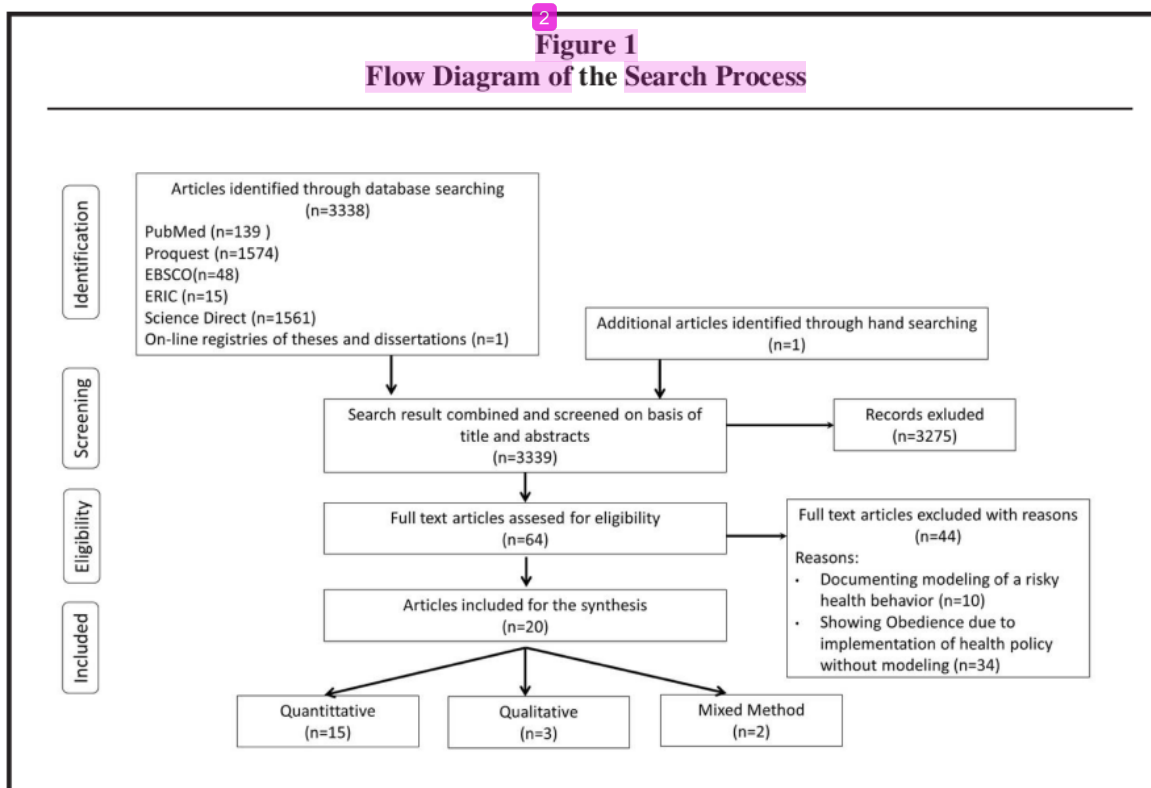
Overall Findings

The studies identified several main domains as predictive factors that could be categorized into the aforementioned 4 conditions that occur in modeling. We summarize these findings in Appendix 4 and offer additional detail below.

The 4 Conditions in Modeling

Attention. We identified 16 studies with findings that could be defined as predictive factors related to attention in modeling. These factors could be divided into 4 domains: an influential role model's characteristics, the characteristics of the observer, the use of technology to model healthy behavior, and peers as role models in promoting healthy behavior. To be considered an influential role model of healthy behavior, a person must be competent,[27,36] have a specific skill to model healthy behavior,[34,36] have a conscious awareness of being a positive role model,[15,26,30,31,34,40,41] and respect the autonomy of others.[32,36] The characteristics of observers also influence attention to the health behavior exhibited

by role models.[35] Additionally, using technology to deliver health behavior information increases people's attention.[23,25,33] One study[39] found that using peers as role models effectively increases a person's awareness of a healthy behavior being modeled.

Retention. Two studies highlighted predictive factors related to the retention condition and modeling. Knowing the benefits of performing a health behavior (or the risk of not performing that behavior) and health behavior information also influence whether this information becomes committed to memory.[36] The time interval from observation to the modeled behavior's performance is also described in terms of whether the information captured from the role model committed to long-term memory or not.[21]

Motor reproduction. Three studies highlighted the importance of having an opportunity to perform a healthy behavior.[25,32,36] Without opportunity to reproduce the modeled and observed behavior, the information cannot be retained for long by the human brain. Therefore, the interval of

time from observation to opportunity to reproduce the behavior is also essential for successful translation of the modeled behavior to actual health behavior change.[21]

Motivation. The environment plays a vital role in maintaining a person's motivation to carry out health behaviors. One study highlighted the importance of a role model's active involvement when they want to model a health behavior to others.[29] Parents have the most influence on their children when they want to teach their children about healthy behavior.[23,26,28,30-32,37,41] In modeling healthy behavior, peers[35,39] and all family or community members[14,26,28,32,34,40] also make a significant contribution in support of health behavior change. To maintain motivation for healthy behavior, a person needs to set a specific behavioral goal.[23,29,36] Policy that regulates the environment also supports healthy behavior performance[14,34,38,40,41] and serves as a further contingent reward.[23] Some studies highlight that a good family relationship provides social support for health behavior change in children and facilitates discussion about any unhealthy or disease conditions.[32,33,36,38,41] People also need self-efficacy[21,25,26,35] and self-regulation[32,36] to motivate themselves to perform healthy behavior consistently.

DISCUSSION

In this review, we found many predictive factors that could be strategies for increasing the effect of modeling on the subsequent adoption of a health behavior. The evidence from this review highlights some characteristics of role models that can improve people's attentiveness toward the healthy behavior they perform. Most studies[14,26,30,31,34,40,41] we included in our review highlight the importance of having conscious awareness of being a role model. Parents who have a conscious awareness that their behavior can impact their children's behavior are more likely to take on an active role in that regard.[30,31] Parents realize that they have a responsibility to be primary role models.[41] Also, they are aware of the need to be consistent in what they say and do with regard to health behaviors.[14,40] Developing a conscious awareness of being role models when interacting with others is crucial to being influential.[42]

To attract the attention of others, a role model

must be competent. Role models must know the benefits of the health behavior they model,[36] and have the specific skills to display them to children.[34] In addition to being competent, several studies[23,24,33] we included describe that using technology to promote health behavior is also useful for promoting attentiveness. Moreover, an influential role model knows how to create a safe environment for others to learn healthy behavior. Shanon et al[27] and Pedersen et al[36] describe that parents can create a safe environment for their children by giving them a chance to discuss any problems about performance of health behaviors. When children discuss issues about health behavior with their parents, they are already attentive to the modeled behavior, which is the first step of successful modeling and behavior adoption.[5,6] Discussion with parents can enhance self-efficacy, and elevate the likelihood of behavior change occurring.[6] Also, getting feedback from a role model can facilitate cognitive rehearsal and enactment, which are needed to retain the information in long-term memory.[6]

Having peers as role models increases the possibility of behavior adoption. Layzer et al[39] found that a sexual health education program that facilitated peer-learning created a safe environment for students and helped them across a range of issues related to social well-being and sexual health. However, role models' attitude about respecting others' autonomy is also crucial to facilitating health behavior change. For children to practice self-regulation, parents must provide them with opportunities to manage the behavior they want them to do, while still offering assistance.[32,36]

People need to remember the information they get from observations of modeled health behavior before performing that behavior themselves. Although this new knowledge is recorded, not all of it may be important to commit to memory.[6] In this review, we found that the types of information people receive determine how it is translated to behavior.[36] Demonstrating the benefit of performing a health behavior compared to showing the consequences of adopting a risk behavior may increase the probability that the information gets translated successfully into a healthy behavior, but this topic is still controversial. Green and Witte[44] found that delivering information about the negative consequences of unhealthy sexual behavior was

more effective in Africa than in the US. Therefore, cultural relevance may be important as a behavioral determinant.[22]

In this review, we also considered a specific timeframe between the modeled behavior and its observation stage to the actual performing of a health behavior. Parent and Fortin[21] found no significant differences between the intervention (a group accompanied by role model) and control group on self-efficacy expectation for general activities, walking, climbing stairs, and self-reported activity for walking at 4 weeks after discharge. However, future study is needed to investigate a more precise timeframe of how long the information obtained from the observation of healthy behavior from role models could be retained in memory.

Information committed to memory should be strengthened to increase the possibility that health information is translated into the desired behavior. People need an opportunity to attempt healthy behavior because by practicing it, approximately 90% of the information will be retained by the brain.[45] A safe environment is needed to encourage health behavior learned through modeling. A role model should offer frequent opportunities for others to practice the behavior that was observed. Parents must respond positively to children when they want to be active participants – for example – in the promotion of healthy eating among family members.[36] Some studies[15,26,28,31,34,40] in our review also highlight the roles of social support from people in the immediate environment (eg, parents, friends, teachers, and other family members) to increasing the effectiveness of modeled health behaviors. They should be rehearsed together consistently to increase the possibility of modeling being reflected in subsequent health behavior.[23,25,26,28]

Because health behavior must be practiced continuously, people need the appropriate incentives. We highlighted the environment's role in producing both positive and negative influence relative to health behavior. Health intervention programs and policies in schools positively have influenced the physical activity of pre-adolescent girls.[23] Providing rewards/incentives for eating fruits or vegetables can motivate children to sustain that behavior.[23] However, the presence of a policy that forces people toward particular health behaviors does not always guarantee that they will achieve those behaviors.[13]

The involvement of significant others in the health behavior, ie, parents and all family members, may be more vital than the mere solitary existence of a given policy. Olivares et al[28] found that parents' and other family members' active involvement are more effective than that of teachers in students' maintenance of desirable health behavior – perhaps because parents have more time to interact with their children than does a teacher. They have more opportunities to control and immediately intervene when they detect a child's tendency toward unhealthy behavior.[38] Cheney et al[32] found that a strong relationship with parents could protect adolescents and young adults from tobacco use. Pedersen et al[36] found that the availability of time to discuss conflicting issues about health could increase children's involvement in physical activity. However, Cheney et al[32] found that gender also influences receptivity to parent-child discussion, with boys more likely to talk with their father than mother and vice versa. Bylund et al[40] found that the college environment negatively influences health behaviors that students had practiced at home. Therefore, people need self-regulation as much as self-efficacy to increase learn and maintain health behaviors derived from modeling.[28,46] Even though self-efficacy directly influences motivation to perform health behavior,[25,36] health behavior change is more effective when a person also has self-regulation.[36]

Strengths and Limitations of this Review

To the best of our knowledge, this is the first systematic review to categorize predictive factors into the 4 main conditions of modeling healthy behavior. For our review, we used a detailed search strategy to determine the potential factors related to the 4 main conditions necessary before an individual can be successful modeling someone else's health behavior: attention, retention, motor reproduction, and motivation. We also categorized the factors we found in the literature that may be investigated in future studies.

This study has several limitations. We included only articles that were written in English. Only a few of the included studies used role models to promote health behavior, so generalization must be approached with caution. We used only 5 search engines to conduct the literature search. No analyses were done on the level of agreement among

the reviewers. For future research, we recommend investigating predictive factors already categorized according to the 4 main modeling conditions to strengthen social cognitive theory's application concerning adoption of health behaviors learned through modeling. In future studies, we also recommend combining culturally-sensitive meta-analyses with systematic and scoping reviews to evaluate the quality of the included studies on this topic.

Conclusions

We found several potential factors in each condition of modeling. An influential role model has specific skills for modeling health behavior and respecting the autonomy of others; moreover, age, gender of the observer, use of technology in modeling health behavior, and using peers as healthy role models were potential factors in attracting attention to the behavior. Noting a specific timeframe for performing the modeled health behavior and for applying the relevant information were potential factors for retention. Opportunity to perform a modeled health behavior and a specific timeframe to perform what was observed were key elements for successful motor reproduction. Environmental influences (eg, parents' active involvement in modeling healthy behavior, available of rewards/incentives, and availability of supportive policy), self-efficacy, and self-regulation were potential factors for effective motivation. By understanding these factors, we are better able to design and plan appropriate and responsive interventions to increase the learning of health behaviors through modeling. In the future studies need to focus on the factors in each condition of modeling, and to address each factor's strength in predicting health behavior change linked to social cognitive theory.

Human Subjects Approval Statement

This study did not involve original data collection with human subjects, and therefore, was exempt from review. The datasets used and analyzed are available from the corresponding author.

Conflicts of Interest Disclosure Statement

The authors report no conflict of interest. The authors alone are responsible for the content and writing the article.

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Appendix 1
Search Strategy

Database	Search strategy
PubMed	((((((((learning) AND role model*[Title/Abstract]) AND modeling[Title/Abstract]) AND health behavior) AND health behavior change) AND health risk behavior) OR risky health behavior) AND social cognitive theory
ProQuest New Platform	(health behavior) AND (health behavior change) AND (role modeling) OR (role modeled) OR (role models) AND (social cognitive theory) OR (cognitive social theory)
EBSCOHost	learning AND AB "role modeling" OR AB "role modeled" OR AB "role models" AND "Social cognitive theory" OR "cognitive social theory" AND AB "health behavior" AND "health risk behavior" OR "risky health behaviors" AND "health behavior change"
ERIC	learning AND "role modeling" OR "role modeled" OR "role models" AND "social cognitive theory" AND "health behavior" AND "health risk behavior" OR "risky health behaviors" AND "Health behavior change"
ScienceDirect	"health behavior" AND "health risk behavior" OR "risky health behaviors" AND "health behavior change" AND "role modeling" OR "role modeled" OR "role models" AND "social cognitive theory" OR "cognitive social theory" AND learning

Appendix 2
BEME Data Extraction Sheet

Section 1. Administrative

Reviewer	
Title	
Year	
University, Country	
Authors	

Section 2. Summary of papers according to quality indicators (details below)

No.	Quality indicator	Score (0 or 1)	Summary
1	Research question		
2	Study subjects		
3	Data collection method		
4	Completeness of Data		
5	Control of confounding		
6	Analysis of results		
7	Conclusions		
8	Reproducibility		
9	Prospective		
10	Ethical issues		
11	Triangulation		

Section 3. Documented influences of learning a healthy behavior through modeling

Section 4. Any other comments regarding the article

- BEME scoring taken from BEME review on E-Portfolios
- Quality indicators for all studies. Quality indicators against which all studies were assessed are given, together with clarification of meaning in each case.
- Quality assessment of studies. To assess the quality of included studies, a series of 11 quality 'indicators' was developed. These are related to the appropriateness of the study design, conduct, results analysis, and conclusions. Higher-quality studies were considered to be those which met a minimum of 8 of these 11 indicators.

Quality Indicator Details
1. Research question: Is the research question(s) or hypothesis clearly stated?
2. Study subjects: Is the subject group appropriate for the study being carried out (number, characteristics, selection, and homogeneity)?
3. 'Data' collection methods: Are the methods used (qualitative or quantitative) reliable and valid for the research question and context?
4. Completeness of 'data': Have subjects dropped out? Is the attrition rate less than 50%? For questionnaire based studies, is the response rate acceptable (60% or above)?
5. Control for confounding: Have multiple factors/variables been removed or accounted for where possible?
6. Analysis of results: Are the statistical or other methods of results analysis used appropriate?
7. Conclusions: Is it clear that the data justify the conclusions drawn?
8. Reproducibility: Could the study be repeated by other researchers?
9. Prospective: Does the study look forwards in time (prospective) rather than backwards (retrospective)?
10. Ethical issues: Were all relevant ethical issues addressed?
11. Triangulation: Were results supported by data from more than one source?

Appendix 3
The Summary of the Included Studies

(Due to the number studies and the size of the appendix, Appendix 3 can be accessed at:
http://bit.ly/Appendix3MAL)

Appendix 4
The Summary of Predicting Factors to Increase the Effectiveness of Learning Healthy Behavior through Role Modeling Based on the 4 Conditions of Role Modeling

The condition which occurs in role modeling	The predicting factors to increase the effectiveness of learning healthy behavior through role modeling

Attention	▪ The characteristics of an influential role model:
	  ✓ The model must be competent (Pedersen et al, 2012; Shannon, 2014) and have a specific skill to model a health behavior (Tibbs et al, 2001; Pedersen et al, 2012);
	  ✓ The model has a conscious awareness of being a positive role model (Tibbs et al, 2001; Bylund et al, 2010; Eisenberg et al, 2012; Cheng et al, 2014; Liu et al, 2017; Brunet et al, 2017; Walsh et al, 2017); and,
	  ✓ The model respects the autonomy of others (Pedersen et al, 2012; Cheney et al, 2015).
	▪ The characteristics of observer, ie, age and gender (Wrobles 2010).
	▪ The use of technology to model healthy behavior (Hardman et al, 2009; Whittaker et al, 2011; Eather et al, 2013).
	▪ Peer as a role model in promoting healthy behavior (Layzer et al, 2014).

Retention	▪ A specific timeframe from observation to the performance of the modeled behavior (Parent and Fortin, 2000). ▪ The types of healthy behavior information: positive or negative information (Pedersen et al, 2012).
Motor reproduction	▪ The availability of opportunity to perform one healthy behavior (Pedersen et al, 2012; Eather et al, 2013; Cheney et al, 2015). ▪ A specific timeframe to perform one healthy behavior which observed from the model (Parent and Fortin, 2000).
Motivation	▪ The environmental support, eg, the active involvement of models in a healthy behavior (Rogers et al, 2005); the involvement of parents (Hardman et al, 2009; Cheng et al, 2014; Cheney et al, 2015; Olivares et al, 2015; Blisset et al, 2016; Liu et al, 2017; Brunet et al, 2017; Walsh et al, 2017), peers (Layr et al, 2014; Wrobleski, 2010), and all members of the family in the healthy behavior (Tibbs et al, 2001; Bylund et al, 2010; Eisenberg et al, 2012; Cheng et al, 2014; Cheney et al, 2015; Olivares et al, 15); rewards (Hardman et al, 2009); a policy of doing healthy behavior in environment (Tibbs et al, 2001; Bylund et al, 2010; Eisenberg et al, 2012; Walsh et al, 2017; Suggs et al, 2018); a strong relationship th mother or father (Cheney et al, 2015); specific target of doing a healthy behavior (Rogers et al, 2005; Hardman et al, 20(edersen et al, 2012); and, the opportunity to discuss a conflicting healthy behavior (Whittaker et al, 2011; Pedersen et al, 2012; Cheney et al, ; Walsh et al, 2017; Suggs et al, 2018). ▪ Self-efficacy (Parent and Fortin, 2000; Wrobleski, 2010; Eather et al, 2013; Cheng et al, 2014). ▪ Self-regulation owned by one person (Pedersen et al, 2012; Cheney et al, 2015).

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