

BMJ Open

BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (<http://bmjopen.bmj.com>).

If you have any questions on BMJ Open's open peer review process please email info.bmjopen@bmj.com

BMJ Open

Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2021-053870
Article Type:	Protocol
Date Submitted by the Author:	27-May-2021
Complete List of Authors:	Okuhara, Tsuyoshi; The University of Tokyo, Department of Health Communication; Okada, Hiroko; The University of Tokyo, Department of Health Communication, School of Public Health Goto, Eiko; The University of Tokyo, Department of Health Communication, School of Public Health Kiuchi, Takahiro ; The University of Tokyo, Department of Health Communication, School of Public Health
Keywords:	INFECTIOUS DISEASES, Infection control < INFECTIOUS DISEASES, Public health < INFECTIOUS DISEASES, PUBLIC HEALTH

SCHOLARONE™
Manuscripts

1
2
3 **Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol**
4
5
6
7
8

9 **Author names and affiliations**

10 Tsuyoshi Okuhara¹, Hiroko Okada¹, Eiko Goto¹, Takahiro Kiuchi¹

11
12 ¹ Department of Health Communication, School of Public Health, The University of Tokyo, Tokyo, Japan
13
14
15
16
17

18 **Corresponding author:**

19 Tsuyoshi Okuhara, Department of Health Communication, School of Public Health, The University of Tokyo, 7-3-
20
21 1 Hongo, Bunkyo-ku, Tokyo 113-8655, Japan

22
23 E-mail: okuhara-ctr@umin.ac.jp

24

25 Tel.: +81-3-5800-6549 / Fax: +81-3-5689-0726
26
27

28 **Word Count:** 1,329
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Protocol

Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol

ABSTRACT

Introduction: Vaccine hesitancy is a global problem, impeding uptake of vaccines such as MMR and those against HPV and COVID-19. Effective communication strategy is needed to address vaccine hesitancy. To guide the development of research in the field and the development of effective strategies for vaccine communication, this scoping review aims to analyse studies of interventions using narrative to encourage vaccination.

Methods and analysis: We will search the following databases: MEDLINE, CINAHL, PsycINFO, and PsycARTICLES. We will identify additional literature by searching the reference lists of eligible studies. Eligible studies will be those that quantitatively examined the persuasiveness of narrative to encourage vaccination. Two independent reviewers will screen the titles, abstracts and full texts of all studies identified. Two independent reviewers will share the responsibility for data extraction and verification. Discrepancies will be resolved through consensus. Data such as study characteristics, participant characteristics, methodology, main results, and theoretical foundation will be extracted. The findings will be synthesized in a descriptive and a narrative review.

Ethics and Dissemination: This work does not warrant any ethical or safety concerns. This scoping review will be presented at a relevant conference and published in a peer-reviewed journal.

Keywords

vaccines, vaccination, immunization, vaccine hesitancy, narrative, persuasion, health communication

Strengths and limitations of this study

- This will be the first review of studies of interventions aimed at encouraging vaccination using narrative; hence, evidence generated from the review will contribute to developing research and practice in the field.
- This review could make a timely contribution to vaccination promotion during the COVID-19 pandemic.
- As this is a scoping review, formal quality assessment and risk of bias assessment will not be conducted.
- This review may miss important literature published in languages other than English.

INTRODUCTION

Vaccines have long been lauded as one of the most important public health achievements of the past century. In the past decade, however, a growing number of individuals have begun to perceive vaccination as risky. Vaccine hesitancy, defined as “delay in acceptance or refusal of vaccines despite availability of vaccination service,” is a problem attracting growing attention and concern.[1] Vaccine hesitancy impeding uptake of MMR vaccines and COVID-19 vaccines is a global problem.[2–5] Communication can be an effective tool, if used in a planned and integrated strategy, to counteract vaccine hesitancy and promote optimal vaccine uptake.[6]

Using narrative to motivate health behaviour is an emerging form of persuasion in public health communication.[7–9] Narrative refers to the use of case stories or examples to support the argument offered by the communicator,[8] such as “I suffered greatly from the COVID-19. Therefore, I recommend you receive the COVID-19 vaccine to prevent severe illness due to infection.” Especially in vaccination promotion, using narrative is proposed to counter anti-vaccination messages in mass media and on the internet, which propagate doubt, fear, and opposition to vaccination.[9] These anti-vaccination messages often use an emotional narrative of alleged victims of a vaccine’s side effects.[10] Scholars of vaccine communication have recently directed their interest to using narrative effectively as well, such as describing people feeling secure at recognizing that they and their loved ones are protected by vaccination, or describing an experience of a person whose health suffered because of a preventable disease.[12,13]

However, health-related narrative persuasion research is still emerging. Published studies remain relatively small in number, and few studies have measured health-behaviour outcomes in non-student participants.[13] To our knowledge, no study has reviewed previous studies of interventions aimed at encouraging vaccination using narrative to determine which vaccines have been targeted, what study designs have been adopted (e.g., participant background, sample size, randomisation), and what outcomes have been measured (e.g., vaccination behaviour, behavioural intentions, attitudes). Reviewing them will be important for developing the field of study to encourage vaccination using narrative, for critically examining the results of previous studies, and for applying them to vaccine communication practice.

Recent studies on vaccine communication have shown that narrative messages that recount personal experiences with disease increase an audience’s perception of risk of developing disease, intention to vaccinate, and likelihood of changing behaviour to prevent infectious disease, compared to didactic messages.[15–18] However, communication scholars have not yet reached consensus regarding the persuasiveness of narrative versus didactic messages, and the optimal usage thereof.[15] No studies have reviewed what form of intervention (e.g., statistics) previous studies have adopted to quantify the persuasiveness of narrative to encourage vaccination, and what results those studies have shown.

Although theoretical developments in understanding the mechanisms and processes involved in narrative persuasion remain limited,[16] several theoretical perspectives have been proposed to explain how and why narrative communication may contribute to attitudinal and behavioural changes. The earliest studies applied models of behaviour change — the most representative being social cognitive theory.[17] Then, theories of persuasion in psychology — the most representative being the extended elaboration likelihood model[18] and the transportation-imagery model[19] — were proposed and evaluated. However, no studies have reviewed which theories and

1
2
3 models formed the basis for previous intervention studies of encouraging vaccination using narrative.

4
5 The objective of this review is to create an overview of studies of interventions aimed at encouraging
6 vaccination using narrative, and to identify the content and gaps in these studies. This work will be useful in
7 guiding the development of research in the field and the development of effective strategies for vaccine
8 communication and addressing vaccine hesitancy. Our research questions will be as follows. These wide review
9 objectives and questions will be best achieved and answered through a scoping review.

10
11 RQ1: What study designs have previous intervention studies adopted to examine the persuasiveness of narrative
12 approaches in encouraging vaccination?

13
14 RQ2: What outcomes have previous intervention studies measured to examine the persuasiveness of narrative
15 approaches in encouraging vaccination?

16
17 RQ3: What forms of intervention have previous intervention studies adopted to compare the persuasiveness of
18 narrative in encouraging vaccination?

19
20 RQ4: What results have previous intervention studies shown about the persuasiveness of narrative approaches in
21 encouraging vaccination?

22
23 RQ5: Which theories and models have been used in previous intervention studies to explain the persuasiveness of
24 narrative in encouraging vaccination?
25
26
27

28 29 **METHODS AND ANALYSIS**

30 This systematic scoping review protocol is prepared according to the Preferred Reporting Items for Systematic
31 Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist (see online supplementary
32 file 1).[20]
33
34

35 36 **Literature search**

37 Using the EBSCOhost Search Platform, we will search the following databases: MEDLINE, Cumulative Index to
38 Nursing and Allied Health Literature (CINAHL), PsycINFO, PsycARTICLES. We will search the abstracts using
39 the combination of keywords: (vaccine OR vaccination OR immunization) AND (narrative OR story OR
40 storytelling). We will search the reference lists of identified eligible studies to identify any additional potentially
41 eligible literature.
42
43
44

45 46 47 **Eligibility criteria**

48 We seek to include all intervention studies in these databases that quantitatively examined persuasiveness of
49 narrative to encourage vaccination, both experimental (randomised controlled trials, quasi-randomised controlled
50 trials, non-randomised trials) and quasi-experimental research (interrupted time series, controlled before–after
51 studies). All comparators will be eligible (i.e., any forms of intervention other than using narrative). Studies without
52 a comparator will also be eligible. Grey literature (information produced outside of traditional publishing and
53 distribution channels, such as conference proceedings) will be included if it provides enough information to assess
54 its eligibility. Qualitative studies will be excluded.
55
56
57

58 Studies assessing any outcomes such as behaviour, behavioural intention, and attitude will be eligible, as
59
60

1
2
3 will studies of any kind of vaccination. Studies on participants of any age, gender, ethnicity, and countries will be
4 eligible, and we will not filter by year. Only papers written in English will be included; studies not published in full
5 text will be excluded.
6
7

8 9 **Study selection**

10 Two independent reviewers including the first author (TO) will screen the titles and abstracts of all studies initially
11 identified, according to the eligibility criteria. Disagreements will be resolved by consensus; the opinion of a third
12 reviewer will be sought if necessary. The full text versions of potentially relevant studies will be retrieved and
13 screened independently by two reviewers including the first author (TO). Consensus will be reached through
14 discussion, and if no consensus can be reached on any study, a third reviewer will arbitrate. All studies not meeting
15 the eligibility criteria will be excluded. The results will be displayed in a PRISMA flow diagram.
16
17
18
19

20 21 **Data extraction and reporting the results**

22 A customized data extraction form will be created to extract all relevant data from each study. The data extraction
23 form will be piloted in a sample of the eligible studies to assess its reliability in extracting the targeted study data.
24 The first author (TO) will conduct data extraction, and another author will check the extracted data against the full
25 texts of the studies to ensure that there are no omissions or errors. Consensus will be reached through discussion,
26 and if no consensus can be reached on any study, a third reviewer will arbitrate. The following data will be
27 extracted: study characteristics (author, year of publication, type of paper, and country), participant characteristics
28 (student or non-student, gender, age, and other demographic information), methodology (study design, sample size,
29 and outcome), comparators (forms of intervention other than using narrative), main results of the intervention, and
30 theoretical foundation of the intervention. The findings will be summarised in a concise table and synthesized in a
31 descriptive and a narrative review. We will discuss the findings and their implications for future research and
32 practice as we answer each of the research questions.
33
34
35
36
37
38
39
40

41 **Patient and Public Involvement**

42 No patient involved.
43
44

45 **CONCLUSIONS**

46 This scoping review will provide an overview of studies of interventions aimed at encouraging vaccination using
47 narrative. This review will contribute to the development of research in the field and of effective strategies for
48 vaccine communication and addressing vaccine hesitancy. We expect to report in autumn of 2021.
49
50
51

52 **ETHICS AND DISSEMINATION**

53 This work does not warrant any ethical or safety concerns. We intend to present the results of this review at a
54 relevant conference and publish them in a peer-reviewed journal.
55
56
57
58
59
60

Contributors

All authors have made substantive intellectual contributions to the development of this protocol. TO was involved in conceptualising this review and in writing this protocol. HO, EG and TK commented critically on several drafts of the manuscript.

Acknowledgement

We thank John Daniel from Edanz (<https://jp.edanz.com/ac>) for editing a draft of this manuscript.

Funding

This work was supported by the Japan Society for the Promotion of Science KAKENHI (grant number 19K10615, 19K22743).

Competing interests

None declared.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication

Not required.

REFERENCES

- 1 MacDonald NE, Eskola J, Liang X, *et al.* Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 2015;**33**:4161–4. doi:10.1016/j.vaccine.2015.04.036
- 2 Sallam M. Covid-19 vaccine hesitancy worldwide: A concise systematic review of vaccine acceptance rates. *Vaccines* 2021;**9**:1–15. doi:10.3390/vaccines9020160
- 3 Robinson E, Jones A, Lesser I, *et al.* International estimates of intended uptake and refusal of COVID-19 vaccines: A rapid systematic review and meta-analysis of large nationally representative samples. *Vaccine* 2021;**39**:2024–34. doi:10.1016/j.vaccine.2021.02.005
- 4 Bankamp B, Hickman C, Icenogle JP, *et al.* Successes and challenges for preventing measles, mumps and rubella by vaccination. *Curr Opin Virol* 2019;**34**:110–6. doi:10.1016/j.coviro.2019.01.002
- 5 Wilder-Smith AB, Qureshi K. Resurgence of measles in Europe: A systematic review on parental attitudes and beliefs of measles vaccine. *J Epidemiol Glob Health* 2020;**10**:46–58. doi:10.2991/JEGH.K.191117.001
- 6 Goldstein S, MacDonald NE, Guirguis S, *et al.* Health communication and vaccine hesitancy. *Vaccine* 2015;**33**:4212–4. doi:10.1016/j.vaccine.2015.04.042

- 1
2
3
4 7 Hinyard LJ, Kreuter MW. Using narrative communication as a tool for health behavior change: A conceptual,
5 theoretical, and empirical overview. *Heal Educ Behav* 2007;**34**:777–92. doi:10.1177/1090198106291963
6
7 8 Braddock K, Dillard JP. Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes,
8 intentions, and behaviors. *Commun Monogr* 2016;**83**:446–67. doi:10.1080/03637751.2015.1128555
9
10 9 Shelby A, Ernst K. Story and science: How providers and parents can utilize storytelling to combat anti-vaccine
11 misinformation. *Hum Vaccines Immunother* 2013;**9**:1795–801. doi:10.4161/hv.24828
12
13 10 Leask J. Target the fence-sitters. *Nature* 2011;**473**:443–5.
14
15 11 Betsch C, Brewer NT, Brocard P, *et al*. Opportunities and challenges of Web 2.0 for vaccination decisions.
16 *Vaccine* 2012;**30**:3727–33. doi:10.1016/j.vaccine.2012.02.025
17
18 12 Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement:
19 Influence, impact and implications. *Expert Rev Vaccines* 2014;**14**:99–117. doi:10.1586/14760584.2015.964212
20
21 13 de Graaf A, Sanders J, Hoeken H. Characteristics of narrative interventions and health effects: A review of the
22 content, form, and context of narratives in health-related narrative persuasion research. *Rev Commun Res*
23 2016;**4**:81–131. doi:10.12840/issn.2255-4165.2016.04.01.011
24
25 14 Prati G, Pietrantonio L, Zani B. Influenza Vaccination: The Persuasiveness of Messages Among People Aged 65
26 Years and Older. *Health Commun* 2012;**27**:413–20. doi:10.1080/10410236.2011.606523
27
28 15 Winterbottom A, Bekker HL, Conner M, *et al*. Does narrative information bias individual’s decision making? A
29 systematic review. *Soc Sci Med* 2008;**67**:2079–88. doi:10.1016/j.socscimed.2008.09.037
30
31 16 Moyer-Gusé E. Toward a theory of entertainment persuasion: Explaining the persuasive effects of entertainment-
32 education messages. *Commun Theory* 2008;**18**:407–25. doi:10.1111/j.1468-2885.2008.00328.x
33
34 17 Bandura A. Health promotion by social cognitive means. *Heal Educ Behav* 2004;**31**:143–64.
35 doi:10.1177/1090198104263660
36
37 18 Slater MD, Rouner D. Entertainment-education and elaboration likelihood: Understanding the processing of
38 narrative persuasion. *Commun Theory* 2002;**12**:173–91. doi:10.1111/j.1468-2885.2002.tb00265.x
39
40 19 Green MC, Brock TC. The role of transportation in the persuasiveness of public narratives. *J Pers Soc Psychol*
41 2000;**79**:701–21. doi:10.1037/0022-3514.79.5.701
42
43 20 Tricco AC, Lillie E, Zarin W, *et al*. PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and
44 explanation. *Ann Intern Med* 2018;**169**:467–73. doi:10.7326/M18-0850
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist; Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	
Limitations	20	Discuss the limitations of the scoping review process.	
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).



BMJ Open

Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2021-053870.R1
Article Type:	Protocol
Date Submitted by the Author:	17-Jan-2022
Complete List of Authors:	Okuhara, Tsuyoshi; The University of Tokyo, Department of Health Communication; Okada, Hiroko; The University of Tokyo, Department of Health Communication, School of Public Health Goto, Eiko; The University of Tokyo, Department of Health Communication, School of Public Health Kiuchi, Takahiro ; The University of Tokyo, Department of Health Communication, School of Public Health
Primary Subject Heading:	Public health
Secondary Subject Heading:	Communication, Infectious diseases, Public health
Keywords:	INFECTIOUS DISEASES, Infection control < INFECTIOUS DISEASES, Public health < INFECTIOUS DISEASES, PUBLIC HEALTH

SCHOLARONE™
Manuscripts

1
2
3 **Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol**
4
5
6
7
8

9 **Author names and affiliations**

10 Tsuyoshi Okuhara¹, Hiroko Okada¹, Eiko Goto¹, Takahiro Kiuchi¹

11
12 ¹ Department of Health Communication, School of Public Health, The University of Tokyo, Tokyo, Japan
13
14
15
16
17

18 **Corresponding author:**

19 Tsuyoshi Okuhara, Department of Health Communication, School of Public Health, The University of Tokyo, 7-3-
20
21 1 Hongo, Bunkyo-ku, Tokyo 113-8655, Japan

22
23 E-mail: okuhara-ctr@umin.ac.jp

24
25 Tel.: +81-3-5800-6549 / Fax: +81-3-5689-0726
26
27

28 **Word Count:** 1,407
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Protocol

Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol

ABSTRACT

Introduction: Vaccine hesitancy is a global problem, impeding uptake of vaccines such as MMR and those against HPV and COVID-19. Effective communication strategy is needed to address vaccine hesitancy. To guide the development of research in the field and the development of effective strategies for vaccine communication, this scoping review aims to analyse studies of interventions using narrative to encourage vaccination.

Methods and analysis: We will search the following databases: MEDLINE, CINAHL, PsycINFO, and PsycARTICLES. We will identify additional literature by searching the reference lists of eligible studies. Eligible studies will be those that quantitatively examined the persuasiveness of narrative to encourage vaccination. Two independent reviewers will screen the titles, abstracts and full texts of all studies identified. Two independent reviewers will share the responsibility for data extraction and verification. Discrepancies will be resolved through consensus. Data such as study characteristics, participant characteristics, methodology, main results, and theoretical foundation will be extracted. The findings will be synthesized in a descriptive and a narrative review.

Ethics and Dissemination: This work does not warrant any ethical or safety concerns. This scoping review will be presented at a relevant conference and published in a peer-reviewed journal.

Keywords

vaccines, vaccination, immunization, vaccine hesitancy, narrative, persuasion, health communication

Strengths and limitations of this study

- We use the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist, the most current guidance on conducting scoping reviews, in order to ensure a systematic approach to searching, screening and reporting.
- As this is a scoping review, formal quality assessment and risk of bias assessment will not be conducted.
- This review may miss important literature published in languages other than English.

INTRODUCTION

Vaccines have long been lauded as one of the most important public health achievements of the past century. In the past decade, however, a growing number of individuals have begun to perceive vaccination as risky. Vaccine hesitancy, defined as “delay in acceptance or refusal of vaccines despite availability of vaccination service,” is a problem attracting growing attention and concern.[1] Vaccine hesitancy impeding uptake of MMR vaccines and COVID-19 vaccines is a global problem.[2–5] Communication can be an effective tool, if used in a planned and integrated strategy, to counteract vaccine hesitancy and promote optimal vaccine uptake.[6]

Using narrative to motivate health behaviour is an emerging form of persuasion in public health communication.[7][8] Narrative refers to the use of case stories or examples to support the argument offered by the communicator,[8] such as “I suffered greatly from the COVID-19. Therefore, I recommend you receive the COVID-19 vaccine to prevent severe illness due to infection.” Especially in vaccination promotion, using narrative is proposed to counter anti-vaccination messages in mass media and on the internet, which propagate doubt, fear, and opposition to vaccination.[9] These anti-vaccination messages often use an emotional narrative of alleged victims of a vaccine’s side effects.[10] Scholars of vaccine communication have recently directed their interest to using narrative effectively as well, such as describing people feeling secure at recognizing that they and their loved ones are protected by vaccination, or describing an experience of a person whose health suffered because of a preventable disease.[11][12]

However, health-related narrative persuasion research is still emerging. Published studies remain relatively small in number, and few studies have measured health-behaviour outcomes in non-student participants.[13] To our knowledge, no study has reviewed previous studies of interventions aimed at encouraging vaccination using narrative to determine which vaccines have been targeted, what study designs have been adopted (e.g., participant background, sample size, randomisation), and what outcomes have been measured (e.g., vaccination behaviour, behavioural intentions, attitudes). Reviewing them will be important for developing the field of study to encourage vaccination using narrative, for critically examining the results of previous studies, and for applying them to vaccine communication practice.

Recent studies on vaccine communication have shown that narrative messages that recount personal experiences with disease increase an audience’s perception of risk of developing disease, intention to vaccinate, and likelihood of changing behaviour to prevent infectious disease, compared to didactic messages.[14] However, communication scholars have not yet reached consensus regarding the persuasiveness of narrative versus didactic messages, and the optimal usage thereof.[15] No studies have reviewed what form of intervention (e.g., statistics) previous studies have adopted to quantify the persuasiveness of narrative to encourage vaccination, and what results those studies have shown.

Although theoretical developments in understanding the mechanisms and processes involved in narrative persuasion remain limited,[16] several theoretical perspectives have been proposed to explain how and why narrative communication may contribute to attitudinal and behavioural changes. The earliest studies applied models of behaviour change — the most representative being social cognitive theory.[17] Then, theories of persuasion in psychology — the most representative being the extended elaboration likelihood model[18] and the transportation-imagery model[19] — were proposed and evaluated. However, no studies have reviewed which theories and

1
2
3 models formed the basis for previous intervention studies of encouraging vaccination using narrative.

4
5 The objective of this review is to create an overview of studies of interventions aimed at encouraging
6 vaccination using narrative, and to identify the content and gaps in these studies. This scoping review will serve as
7 a useful reference for researchers who plan future intervention studies on vaccine communication using narrative,
8 speeding up their research and helping them to conduct better designed intervention studies. This work will be
9 useful in guiding the development of research in the field and the development of effective strategies for vaccine
10 communication and addressing vaccine hesitancy. Our research questions will be as follows. These wide review
11 objectives and questions will be best achieved and answered through a scoping review.

12
13 RQ1: What study designs have previous intervention studies adopted to examine the persuasiveness of narrative
14 approaches in encouraging vaccination?

15
16 RQ2: What outcomes have previous intervention studies measured to examine the persuasiveness of narrative
17 approaches in encouraging vaccination?

18
19 RQ3: What forms of intervention other than using narrative have previous intervention studies adopted to compare
20 and combine with the persuasiveness of narrative in encouraging vaccination?

21
22 RQ4: What results have previous intervention studies shown about the persuasiveness of narrative approaches in
23 encouraging vaccination including comparisons and combinations with other forms of intervention than using
24 narrative?

25
26 RQ5: Which theories and models have been used in previous intervention studies to explain the persuasiveness of
27 narrative in encouraging vaccination?

28 29 30 31 32 33 **METHODS AND ANALYSIS**

34
35 This systematic scoping review protocol is prepared according to the Preferred Reporting Items for Systematic
36 Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist (see online supplementary
37 file 1).[20] The planned start date for the study is April 1, 2022, and the planned end date is March 31, 2023.

38 39 40 41 **Literature search**

42
43 Using the EBSCOhost Search Platform, we will search the following databases: MEDLINE, Cumulative Index to
44 Nursing and Allied Health Literature (CINAHL), PsycINFO, PsycARTICLES. We will search the abstracts using
45 the combination of keywords: (vaccine OR vaccination OR immunization) AND (narrative OR story OR
46 storytelling). We will search the reference lists of identified eligible studies to identify any additional potentially
47 eligible literature.

48 49 50 51 **Eligibility criteria**

52
53 We seek to include all intervention studies in these databases that quantitatively examined persuasiveness of narrative
54 to encourage vaccination, both experimental (e.g., randomised controlled trials, quasi-randomised controlled trials,
55 non-randomised trials) and quasi-experimental research (e.g., pretest–posttest design, posttest design). All
56 comparators will be eligible (i.e., any forms of intervention other than using narrative). Studies without a comparator
57 will also be eligible. Grey literature (information produced outside of traditional publishing and distribution channels,
58
59
60

1
2
3 such as conference proceedings) will be included if it provides enough information to assess its eligibility. Qualitative
4 studies will be excluded.
5

6 Studies assessing any outcomes such as behaviour, behavioural intention, and attitude will be eligible, as
7 will studies of any kind of vaccination. Studies on participants of any age, gender, ethnicity, and countries will be
8 eligible, and we will not filter by year. Only papers written in English will be included; studies not published in full
9 text will be excluded.
10
11

12 13 14 **Study selection**

15 Two independent reviewers including the first author (TO) will screen the titles and abstracts of all studies initially
16 identified, according to the eligibility criteria. Disagreements will be resolved by consensus; the opinion of a third
17 reviewer will be sought if necessary. The full text versions of potentially relevant studies will be retrieved and
18 screened independently by two reviewers including the first author (TO). Consensus will be reached through
19 discussion, and if no consensus can be reached on any study, a third reviewer will arbitrate. All studies not meeting
20 the eligibility criteria will be excluded. The results will be displayed in a PRISMA flow diagram.
21
22
23

24 25 26 **Data extraction and reporting the results**

27 A customized data extraction form will be created to extract all relevant data from each study. The data extraction
28 form will be piloted in a sample of the eligible studies to assess its reliability in extracting the targeted study data.
29 The first author (TO) will conduct data extraction, and another author will check the extracted data against the full
30 texts of the studies to ensure that there are no omissions or errors. Consensus will be reached through discussion,
31 and if no consensus can be reached on any study, a third reviewer will arbitrate. The following data will be
32 extracted: study characteristics (author, year of publication, type of paper, and country), participant characteristics
33 (student or non-student, gender, age, and other demographic information), methodology (study design, sample size,
34 and outcome), comparators and combinations (forms of intervention other than using narrative), main results of the
35 intervention including comparison and combination with other forms of intervention than using narrative, and
36 theoretical foundation of the intervention. The findings will be summarised in a concise table and synthesized in a
37 descriptive and a narrative review. We will discuss the findings and their implications for future research and
38 practice as we answer each of the research questions.
39
40
41
42
43
44
45
46

47 **Patient and public involvement**

48 Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this
49 research.
50
51

52 53 **ETHICS AND DISSEMINATION**

54 This work does not warrant any ethical or safety concerns. We intend to present the results of this review at a
55 relevant conference and publish them in a peer-reviewed journal.
56
57
58
59
60

Contributors

All authors have made substantive intellectual contributions to the development of this protocol. TO was involved in conceptualising this review and in writing this protocol. HO, EG and TK commented critically on several drafts of the manuscript.

Acknowledgement

We thank John Daniel from Edanz (<https://jp.edanz.com/ac>) for editing a draft of this manuscript.

Funding

This work was supported by the Japan Society for the Promotion of Science KAKENHI (grant number 19K10615, 19K22743).

Competing interests

None declared.

Patient consent for publication

Not required.

REFERENCES

- 1 MacDonald NE, Eskola J, Liang X, *et al.* Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 2015;**33**:4161–4. doi:10.1016/j.vaccine.2015.04.036
- 2 Sallam M. Covid-19 vaccine hesitancy worldwide: A concise systematic review of vaccine acceptance rates. *Vaccines* 2021;**9**:1–15. doi:10.3390/vaccines9020160
- 3 Robinson E, Jones A, Lesser I, *et al.* International estimates of intended uptake and refusal of COVID-19 vaccines: A rapid systematic review and meta-analysis of large nationally representative samples. *Vaccine* 2021;**39**:2024–34. doi:10.1016/j.vaccine.2021.02.005
- 4 Bankamp B, Hickman C, Icenogle JP, *et al.* Successes and challenges for preventing measles, mumps and rubella by vaccination. *Current Opinion in Virology* 2019;**34**:110–6. doi:10.1016/j.coviro.2019.01.002
- 5 Wilder-Smith AB, Qureshi K. Resurgence of measles in Europe: A systematic review on parental attitudes and beliefs of measles vaccine. *Journal of Epidemiology and Global Health* 2020;**10**:46–58. doi:10.2991/JEGH.K.191117.001
- 6 Goldstein S, MacDonald NE, Guirguis S, *et al.* Health communication and vaccine hesitancy. *Vaccine* 2015;**33**:4212–4. doi:10.1016/j.vaccine.2015.04.042
- 7 Hinyard LJ, Kreuter MW. Using narrative communication as a tool for health behavior change: A conceptual,

- 1
2
3 theoretical, and empirical overview. *Health Education and Behavior* 2007;**34**:777–92.
4 doi:10.1177/1090198106291963
5
6
7 8 Braddock K, Dillard JP. Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes,
8 intentions, and behaviors. *Communication Monographs* 2016;**83**:446–67.
9 doi:10.1080/03637751.2015.1128555
10
11 9 Shelby A, Ernst K. Story and science: How providers and parents can utilize storytelling to combat anti-
12 vaccine misinformation. *Human Vaccines and Immunotherapeutics* 2013;**9**:1795–801. doi:10.4161/hv.24828
13
14 10 Leask J. Target the fence-sitters. *Nature* 2011;**473**:443–5.
15
16 11 Betsch C, Brewer NT, Brocard P, *et al.* Opportunities and challenges of Web 2.0 for vaccination decisions.
17 *Vaccine* 2012;**30**:3727–33. doi:10.1016/j.vaccine.2012.02.025
18
19 12 Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement:
20 Influence, impact and implications. *Expert Review of Vaccines* 2014;**14**:99–117.
21 doi:10.1586/14760584.2015.964212
22
23 13 de Graaf A, Sanders J, Hoeken H. Characteristics of narrative interventions and health effects: A review of
24 the content, form, and context of narratives in health-related narrative persuasion research. *Review of*
25 *Communication Research* 2016;**4**:81–131. doi:10.12840/issn.2255-4165.2016.04.01.011
26
27 14 Prati G, Pietrantonio L, Zani B. Influenza Vaccination: The Persuasiveness of Messages Among People Aged
28 65 Years and Older. *Health Communication* 2012;**27**:413–20. doi:10.1080/10410236.2011.606523
29
30 15 Winterbottom A, Bekker HL, Conner M, *et al.* Does narrative information bias individual's decision making?
31 A systematic review. *Social Science and Medicine* 2008;**67**:2079–88. doi:10.1016/j.socscimed.2008.09.037
32
33 16 Moyer-Gusé E. Toward a theory of entertainment persuasion: Explaining the persuasive effects of
34 entertainment-education messages. *Communication Theory* 2008;**18**:407–25. doi:10.1111/j.1468-
35 2885.2008.00328.x
36
37
38 17 Bandura A. Health promotion by social cognitive means. *Health Education and Behavior* 2004;**31**:143–64.
39 doi:10.1177/1090198104263660
40
41 18 Slater MD, Rouner D. Entertainment-education and elaboration likelihood: Understanding the processing of
42 narrative persuasion. *Communication Theory* 2002;**12**:173–91. doi:10.1111/j.1468-2885.2002.tb00265.x
43
44 19 Green MC, Brock TC. The role of transportation in the persuasiveness of public narratives. *Journal of*
45 *Personality and Social Psychology* 2000;**79**:701–21. doi:10.1037/0022-3514.79.5.701
46
47 20 Tricco AC, Lillie E, Zarin W, *et al.* PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and
48 explanation. *Annals of Internal Medicine* 2018;**169**:467–73. doi:10.7326/M18-0850
49
50
51
52
53
54
55
56
57
58
59
60

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist; Intervention studies to encourage vaccination using narrative: a systematic scoping review protocol

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	
Limitations	20	Discuss the limitations of the scoping review process.	
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).

