

## **Supplemental Data File 1**

### **Search strategies and retrieved records from each electronic database**

#### **1. PubMed**

Date of search: 10/19/2018

Search strategy:

#1 (medical error OR patient safety incident OR adverse event OR near miss OR human error)  
#2 (health personnel OR second victim OR health professional OR health care provider)  
#3 (psychological impact OR experienc\* OR psychological response OR psychological symptom OR feeling OR emotion\* OR mental health OR cognit\* OR psychosomatic symptom OR coping OR resilience OR peer support OR team building)

#1 and #2 and #3

*n* findings: 3,678

#### **2. Cochrane Library**

Date of search: 10/19/2018

Search strategy:

#1 "medical error" or "patient safety incident" OR "adverse event" or "near miss" or "human error"  
#2 "health personnel" or "second victim" or "health professional" or "health care provider"  
#3 "psychological impact" or "experienc\*" or "psychological response" or "psychological symptom" or "feeling" or "emotion" or "mental health" or "cognit\*" or "psychosomatic symptom" or "coping" or "resilience" or "peer support" or "team building"

#4 #1 AND #2 AND #3

*n* findings: 93

#### **3. Web of Science (core collection) search strategy**

Date of search: 10/19/2018

Search Strategy:

#1 (medical error OR patient safety incident OR human error OR adverse event)<sup>1</sup>  
#2 (health personnel OR second victim OR health professional OR health care provider)  
#3 (psychological impact OR psychological response OR psychological symptom OR feeling OR emotion OR mental health OR cognit\* OR psychosomatic symptom OR coping OR resilience OR peer support OR team building)

#4 #3 AND #2 AND #1

<sup>1</sup>The term near miss" could not be included due to the error message: *Search Error: Invalid query.*

*n* findings: 1,362

#### 4. Scopus

Date of search: 10/19/2018

Search Strategy:

((((( medical AND error) OR patient AND safety AND incident) OR adverse AND event) OR near AND miss) OR human AND error)) AND (((health AND personnel) OR second AND victim) OR health AND professional) OR health AND care AND provider)) AND (((((((((((psychological AND impact) OR experience\*) OR psychological AND response) OR psychological AND symptom) OR feeling) OR emotion\*) OR mental AND health) OR cognit\*) OR psychosomatic AND symptom) OR coping) OR resilience) OR peer AND support) OR team AND building)

*n* findings: 2,220

#### 5. PsycINFO

Date of search: 10/19/2018

Search strategy:

(medical error OR adverse event OR near miss OR human error) AND (health personnel OR second victim OR health professional OR healthcare provider) AND (psychological impact OR experienc\* OR psychological response OR psychological symptom OR feeling OR emotion\* OR mental health OR cognit\* OR psychosomatic symptom OR coping OR resilience OR peer support OR team building)

*n* findings: 465

#### 6. Excerpta Medica Database (EMBASE)

Date of search: 10/19/2018

Search strategy:

#1 (medical error OR patient safety incident OR adverse event OR near miss OR human error)  
#2 (health personnel OR second victim OR health professional OR health care provider)  
#3 (psychological impact OR experienc\* OR psychological response OR psychological symptom OR feeling OR emotion\* OR mental health OR cognit\* OR psychosomatic symptom OR coping OR resilience OR peer support OR team building)

#1 and #2 and #3

*n* findings: 217

#### 7. ScienceDirect

Date of search: 10/19/2018

Search strategy:

("medical error" OR "patient safety incident" OR "adverse event" OR "near miss" OR "human error") AND ("health personnel" OR "second victim" OR "health professional" OR "healthcare provider") AND ("psychological impact" OR "experienc\*" OR "psychological response" OR "psychological symptom" OR "feeling" OR "emotion\*" OR "mental health" OR "cognit\*" OR "psychosomatic symptom" OR "coping" OR "resilience" OR "peer support" OR "team building")

*n* findings: 3,372

## **8. MEDLINE**

Date of search: 10/19/2018

Search strategy:

((medical error or patient safety incident or adverse event or near miss or human error) and (health personnel or second victim or health professional or health care provider) and (psychological impact or experience\* or psychological response or psychological symptom or feeling or emotion\* or mental health or cognit\* or psychosomatic symptom or coping or resilience or peer support or team building))

*n* findings:316

## **9. Cumulative Index of Nursing and Allied Health Literature (CINAHL)**

Date of search: 10/19/2018

Search strategy:

(medical error OR adverse event OR near miss OR human error) AND (health personnel OR second victim OR health professional OR healthcare provider) AND (psychological impact OR experienc\* OR psychological response OR psychological symptom OR feeling OR emotion\* OR mental health OR cognit\* OR psychosomatic symptom OR coping OR resilience OR peer support OR team building)

*n* findings: 369

## Supplemental Data File 2

### Additional searches

#### 1. OpenSIGLE database/opengrey.eu

- Date of the search: 10/10/2018
- Search strategy: (medical error OR patient safety incident OR adverse event OR near miss OR human error) AND (health personnel OR second victim OR health professional OR health care provider) AND (psychological impact OR experienc\* OR psychological response OR psychological symptom OR feeling OR emotion OR mental health OR cognit\* OR psychosomatic symptom OR coping OR resilience OR peer support OR team building)

#### 2. PsycEXTRA

- Date of the search: 10/10/2018
- Search strategy: (medical error OR patient safety incident OR adverse event OR near miss OR human error) AND (health personnel OR second victim OR health professional OR health care provider) AND (psychological impact OR experienc\* OR psychological response OR psychological symptom OR feeling OR emotion OR mental health OR cognit\* OR psychosomatic symptom OR coping OR resilience OR peer support OR team building)

#### 3. Grey Literature Project (<http://www.greylit.org/home>)

- Date of the search: 10/10/2018
- Since the complete search strategy did not reveal any findings, separate searches were conducted for the following search terms: “medical error”, “second victim”, “adverse event”, “patient safety”

### Journals (Volumes January 2000 – October 2018)

1. *Journal of the American Medical Association (JAMA)*
2. *JAMA Internal Medicine* (formerly *Archives of Internal Medicine*)
3. *Annals of Internal Medicine*
4. *BMJ Quality and Safety* (formerly *Quality in Health Care* and *Quality & Safety in Health Care*)
5. *Journal of Patient Safety*

### Reference lists of reviews

1. Brasaite I, Kaunonen M, Suominen T. Healthcare professionals' knowledge, attitudes and skills regarding patient safety: a systematic literature review. *Scand J Caring Sci.* 2015;29:30-50.
2. Cabilan CJ, Kynoch K. Experiences of and support for nurses as second victims of adverse nursing errors: a qualitative systematic review. *JBIR Database System Rev Implement Rep.* 2017;15:2333-2364.
3. Chan ST, Khong PCB, Wang W. Psychological responses, coping and supporting needs of healthcare professionals as second victims. *Int Nurs Rev.* 2017;64:242-262.
4. Coughlan B, Powell D, Higgins MF. The second victim: a review. *Eur J Obstet Gynecol Reprod Biol.* 2017;213:11-16.
5. Lewis EJ, Baernholdt M, Hamric AB. Nurses' experience of medical errors: an integrative literature review. *J Nurs Care Qual.* 2013;28:153-161.
6. Perez B, Knych SA, Weaver SJ, et al. Understanding the barriers to physician error reporting and disclosure: a systemic approach to a systemic problem. *J Patient Saf.* 2014;10:45-51.
7. Sammer CE, Lykens K, Singh KP, et al. What is patient safety culture? A review of the literature. *J Nurs Scholarsh.* 2010;42:156-165.
8. Schwappach DL, Boluarte TA. The emotional impact of medical error involvement on physicians: a call for leadership and organizational accountability. *Swiss Med Wkly.* 2009;139:9-15.

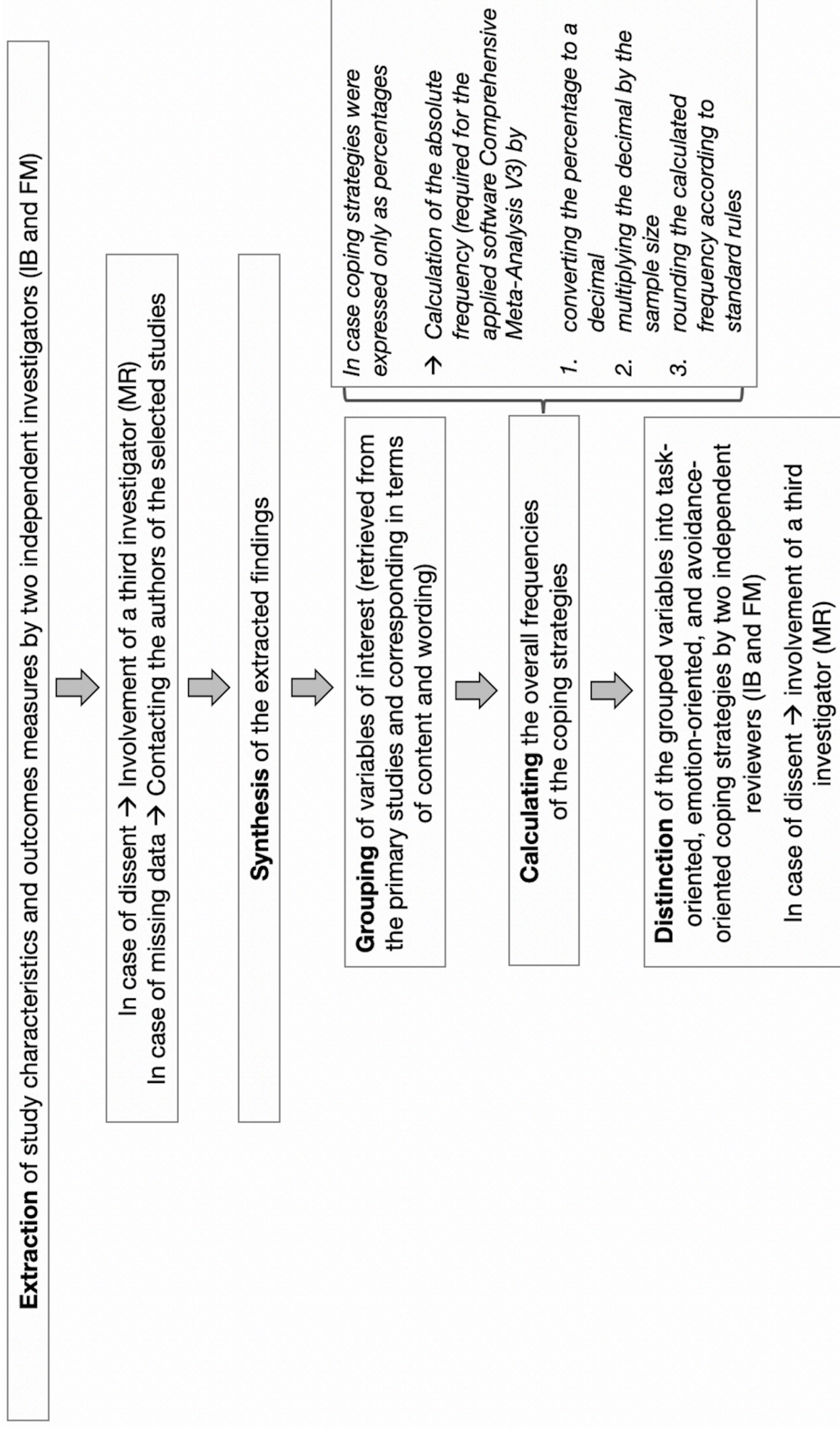
9. Seys D, Wu AW, Van Gerven E, et al. Health care professionals as second victims after adverse events: a systematic review. *Eval Health Prof.* 2013;36:135-162.
10. Seys D, Scott S, Wu A, et al. Supporting involved health care professionals (second victims) following an adverse health event: a literature review. *Int J Nurs Stud.* 2013;50:678-687.
11. Sirriyeh R, Lawton R, Gardner P, et al. Coping with medical error: a systematic review of papers to assess the effects of involvement in medical errors on healthcare professionals' psychological well-being. *Qual Saf Health Care.* 2010;19:e43.
12. White AA, Waterman AD, McCotter P, et al. Supporting health care workers after medical error: considerations for health care leaders. *JCOM.* 2008;15:240-247.
13. Wu AW, Shapiro J, Harrison R, et al. The impact of adverse events on clinicians: what's in a name? *J Patient Saf.* Published Online First: November 4, 2017.doi:10.1097/PTS.0000000000000256

**Reference lists of books, book chapters, white paper, and consensus statement:**

1. Dekker S. *Second Victim. Error, Guilt, Trauma and Resilience.* Boca Raton, FL: CRC Press, Taylor & Francis Group; 2013.
2. Heyman B, Alasyweski A, Shaw M, et al. *Risk, Safety and Clinical Practice. Health care through the lens of risk.* Oxford, UK: Oxford University Press; 2010.
3. Hollnagel E, Wears RL, Braithwaite J. *From Safety-I to Safety-II: A White Paper.* The Resilient Health Care Net: Published simultaneously by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia, 2015.
4. Hurwitz B, Sheikh A, eds. *Health Care Errors and Patient Safety.* West Sussex, UK: BMJ Books; 2009.
5. James JE. Medical Harm: What is it and what is the extent? In: James J, ed. *The Health of Populations: Beyond Medicine.* Cambridge, MA: Academic Press; 2016:105-131.
6. Powell SK. When things go wrong. responding to adverse events: a consensus statement of the Harvard Hospitals. *Lippincotts Case Manag.* 2006;11:193-4.
7. Quick O. *Regulating Patient Safety: The End of Professional Dominance?* Cambridge, UK: Cambridge University Press; 2017.
8. Vincent C. *Patient Safety. Second Edition.* West Sussex, UK: BMJ Books; 2010.
9. Vincent C, Amalberti R. *Safer Healthcare: Strategies for the Real World.* Cham, Switzerland: Springer International Publishing; 2016.
10. Wachter R. *Understanding patient safety.* New York City: McGraw Hill Professional; 2007.

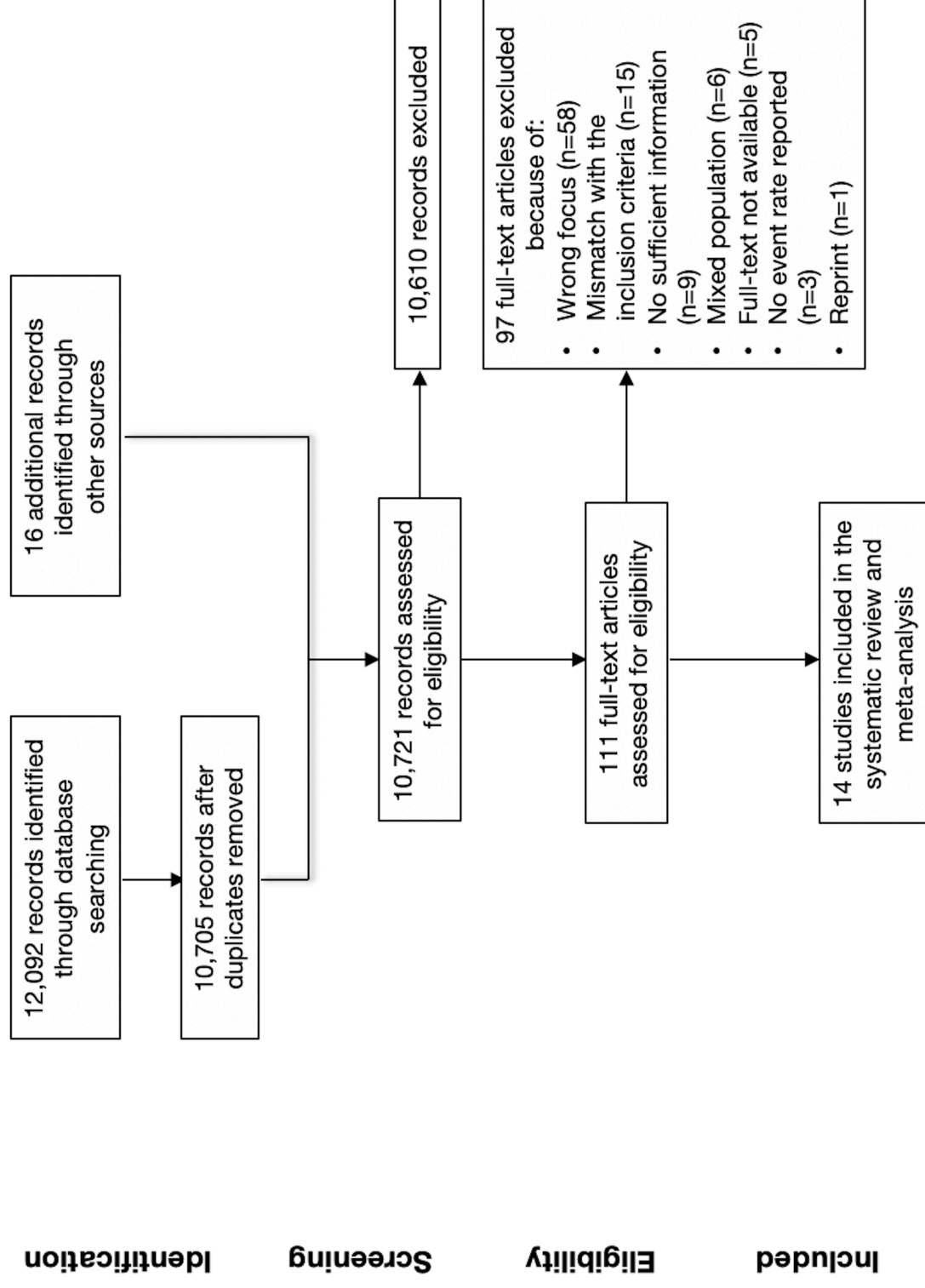
## Supplemental Data File 3

### Methodological steps of data extraction and synthesis



# Supplemental Data File 4

## Prisma Flow Diagram



## Supplemental Data File 5

### Excluded studies

Study	Reason for exclusion
1. Aaraas IJ, Jones B, Gupta TS. [Norwegian and Australian physicians' attitudes to adverse events]. <i>Tidsskr Nor Laegeforen</i> . 2005;125:2204–2206. Norwegian.	Wrong focus
2. Aasland OG, Førde R. Impact of feeling responsible for adverse events on doctors' personal and professional lives: the importance of being open to criticism from colleagues. <i>Qual Saf Health Care</i> . 2005;14:13–17.	Wrong focus
3. Baas MAM, Scheepstra KWF, Stramrood CAI, et al. Work-related adverse events leaving their mark: a cross-sectional study among Dutch gynecologists. <i>BMC Psychiatry</i> . 2018;18:73.	Wrong focus
4. Bark P, Vincent C, Olivieri L, et al. Impact of litigation on senior clinicians: implications for risk management. <i>BMJ Qual Saf</i> . 1997;6:7–13.	Wrong focus
5. Bell SK, Moorman DW, Delbanco T. Improving the patient, family, and clinician experience after harmful events: the "when things go wrong" curriculum. <i>Acad Med</i> . 2010;85:1010–1017.	Wrong focus
6. Bognár A, Barach P, Johnson JK, et al. Errors and the burden of errors: attitudes, perceptions, and the culture of safety in pediatric cardiac surgical teams. <i>Ann Thorac Surg</i> . 2008;85:1374–1381.	Wrong focus
7. Borrell-Carrió F, Regadera CP, Sala RS, et al. [Clinical error and adverse events: primary care doctors' perception]. <i>Aten Primaria</i> . 2006;38:25–32. Spanish.	Wrong focus
8. Burlison JD, Quillivan RR, Scott SD, et al. The effects of the second victim phenomenon on work-related outcomes: connecting self-reported caregiver distress to turnover intentions and absenteeism. <i>J Patient Saf</i> . Published Online First: November 2, 2016 2016.doi:10.1097/PTS.0000000000000301	No frequency of coping strategies reported
9. Carrillo I, Ferrús L, Silvestre C, et al. Propuestas para el estudio del fenómeno de las segundas víctimas en España en atención primaria y hospitales. <i>Rev Calid Asist</i> . 2016;31Supl.2:3–10. Spanish.	No sufficient information
10. Castel ES, Ginsburg LR, Zaheer S, et al. Understanding nurses' and physicians' fear of repercussions for reporting errors: clinician characteristics, organization demographics, or leadership factors? <i>BMC Health Serv Res</i> . 2015;15:326.	Wrong focus
11. Cebeci F, Karazeybek E, Sucu G, et al. Nursing students' medication errors and their opinions on the reasons of errors: a cross-sectional survey. <i>J Pak Med Assoc</i> . 2015;65:457–462.	Wrong focus
12. Chang Y, Mark B. Effects of learning climate and registered nurse staffing on medication errors. <i>Nurse Res</i> . 2011;60:32–39.	Wrong focus
13. Coffey M, Thomas K, Tallett S, et al. Pediatric residents' decision-making around disclosing and reporting adverse events:	Wrong focus

the importance of social context. *Acad Med.* 2010;85:1619–1625.

14. Corkhill V, Merrick K, Tay J. The impact of SUIs on O&G trainees: a national survey of 'second victims'. Poster presented at: RCOG World Congress 2016; June 20-22, 2016; Birmingham, UK.	No sufficient information
15. Cullati S, Cheval B, Schmidt RE, Agoritsas T, Chopard P, Courvoisier DS. Self-Rated Health and Sick Leave among Nurses and Physicians: The Role of Regret and Coping Strategies in Difficult Care-Related Situations. <i>Front Psychol.</i> 2017;8:623.	Wrong focus
16. Cunningham W. The immediate and long-term impact on New Zealand doctors who receive patient complaints. <i>N Z Med J.</i> 2004;117:U972.	Wrong focus
17. Dietz I, Borasio GD, Molnar C, et al. Errors in palliative care: kinds, causes, and consequences: a pilot survey of experiences and attitudes of palliative care professionals. <i>J Palliat Med.</i> 2013;16:74–81.	Wrong focus
18. Edrees HH, Paine LA, Feroli ER, et al. Health care workers as second victims of medical errors. <i>Pol Arch Med Wewn.</i> 2011;121:101–108.	Wrong focus
19. Engel KG, Rosenthal M, Sutcliffe K. Residents' responses to medical error: coping, learning, and change. <i>Acad Med.</i> 2006;81:86–93.	Mismatch with the inclusion criteria
20. Fisseni G, Pentzek M, Abholz HH. Responding to serious medical error in general practice – consequences for the GPs involved: analysis of 75 cases from Germany. <i>Fam Pract.</i> 2008;25:9–13.	Wrong focus
21. Gainotti S, Petrini C, Spedicato MR.[A survey on some Italian doctors' opinions about errors in clinical medicine]. <i>Ann Ist Super Sanità.</i> 2006;42:348–364. Italian.	No sufficient information
22. Gómez-Durán E, Vizcaíno-Rakosnik M, Martin-Fumadó C, et al. Physicians as second victims after a malpractice claim: an important issue in need of attention. <i>J Healthc Qual Res.</i> 2018;33:284–289.	Full-text not available
23. Habermann M, Cramer H. [Survey in hospitals. Nursing errors, error culture and error management.] <i>Pflege Z.</i> 2010;63:552–555.	Full-text not available
24. Han K, Bohnen, JD, Peponis T, et al. The Surgeon as the second victim? Results of the Boston intraoperative adverse events surgeons' attitude (BISA) study. <i>J Am Coll Surg.</i> 2017;224:1048–1056.	Mixed population
25. Harrison R, Lawton R, Perlo J, et al. Emotion and coping in the aftermath of medical error: a cross-country exploration. <i>J Patient Saf.</i> 2015;11:28–35.	No frequency of coping strategies reported
26. Hayashino Y, Utsugi-Ozaki M, Feldman MD, et al. Hope modified the association between distress and incidence of self-perceived medical errors among practicing physicians: prospective cohort study. <i>PLoS ONE.</i> 2012;7:e35585.	Wrong focus

27. Heard GC, Sanderson PM, Thomas RD. Barriers to adverse event and error reporting in anesthesia. <i>Anesth Analg</i> . 2012;114:604–614.	Wrong focus
28. Heard GC, Thomas RD, Sanderson PM. In the aftermath: attitudes of anesthesiologists to supportive strategies after an unexpected intraoperative patient death. <i>Anesth Analg</i> . 2016;122:1614–1624.	Wrong focus
29. Hu YY, Fix ML, Hevelone ND, et al. Physicians' needs in coping with emotional stressors: the case for peer support. <i>Arch Surg</i> . 2012;147:212–217.	Wrong focus
30. Hwang JI, Park HA. Nurses' perception of ethical climate, medical error experience and intent-to-leave. <i>Nurs Ethics</i> . 2014;21:28–42.	Wrong focus
31. Hwang JI, Park HA. Relationships between evidence-based practice, quality improvement and clinical error experience of nurses in Korean hospitals. <i>J Nurs Manag</i> . 2015;23:651–660.	Wrong focus
32. Jones JH, Treiber L. When the 5 rights go wrong: medication errors from the nursing perspective. <i>J Nurs Care Qual</i> . 2010;25:240–247.	Mismatch with the inclusion criteria
33. Kaldjian LC, Forman-Hoffman VL, Jones EW, et al. Do faculty and resident physicians discuss their medical errors? <i>J Med Ethics</i> . 2008;34:717–722.	Wrong focus
34. Kaldjian LC, Jones EW, Wu BJ, et al. Reporting medical errors to improve patient safety: a survey of physicians in teaching hospitals. <i>Arch Intern Med</i> . 2008;168:40–46.	Wrong focus
35. Kershaw K. Adverse clinical incidents: support for midwives. <i>RCM Midwives</i> . 2007;10:462–465.	Wrong focus
36. Kozłowska K, Nunn K, Cousens P. Adverse experiences in psychiatric training. Part 2. <i>Aust N Z J Psychiatry</i> . 1997;31:641–652.	Wrong focus
37. Lander LI, Connor JA, Shah RK, et al. Otolaryngologists' responses to errors and adverse events. <i>Laryngoscope</i> . 2006;116:1114–1120.	No sufficient information
38. Leinweber J, Creedy DK, Rowe H, et al. Responses to birth trauma and prevalence of posttraumatic stress among Australian midwives. <i>Women Birth</i> . 2017;30:40–45.	Wrong focus
39. Lewis EJ, Baernholdt MB, Yan G, et al. Relationship of adverse events and support to RN burnout. <i>J Nurs Care Qual</i> . 2015;30:144–152.	Mixed population
40. Lipitz-Snyderman A, Kale M, Robbins L, et al. Peers without fears? Barriers to effective communication among primary care physicians and oncologists about diagnostic delays in cancer. <i>BMJ Qual Saf</i> . 2017; 26:892–898.	Mismatch with the inclusion criteria
41. Li Y, Cao F, Cao D, et al. Nursing students' post-traumatic growth, emotional intelligence and psychological resilience. <i>J</i>	Wrong focus

42. Mahjoub M, Bouafia N, Cheikh AB, et al.[Patient safety culture based on a non-punitive response to error and freedom of expression of healthcare professionals]. <i>Santé Publique</i> . 2016;5:641–646. French.	Wrong focus
43. Martinez W, Lehmann LS. The “hidden curriculum” and residents’ attitudes about medical error disclosure: comparison of surgical and nonsurgical residents. <i>J Am Coll Surg</i> . 2013;217:1145–1150.	Wrong focus
44. McLennan SR, Engel-Glatzer S, Meyer AH, et al. The impact of medical errors on Swiss anaesthesiologists: a cross-sectional survey. <i>Acta Anaesthesiol Scand</i> . 2015;59:990–998.	Wrong focus
45. Meurier CE, Vincent CA, Parmar DG. Nurses’ responses to severity dependent errors: a study of the causal attributions made by nurses following an error. <i>J Adv Nurs</i> . 1998;27:349–354.	Wrong focus
46. Mira JJ, Carrillo I, Lorenzo S, et al. The aftermath of adverse events in Spanish primary care and hospital health professionals. <i>BMC Health Serv Res</i> . 2015;15:151.	Mixed population
47. Mizrahi T. Managing medical mistakes: ideology, insularity and accountability among internists-in-training. <i>Soc Sci Med</i> . 1984;19:135–146.	Mismatch with the inclusion criteria
48. Mrayyan MT, Shishani K, Al-Faouri I. Rate, causes and reporting medication errors in Jordan: nurses’ perspectives. <i>J Nurs Manag</i> . 2007;15:659–670.	Wrong focus
49. Muller D, Ornstein K. Perceptions of and attitudes towards medical errors among medical trainees. <i>Med Educ</i> . 2007;41:645–652.	Wrong focus
50. Nayar RC, Pandit RV, Gopinath KS. The second victim: ignored in the Indian perspective. <i>Indian J Surg Oncol</i> . 2017;9:114–115.	Mismatch with inclusion criteria
51. Nielsen KJ, Pedersen AH, Rasmussen K, et al. Work-related stressors and occurrence of adverse events in an ED. <i>Am J Emerg Med</i> . 2013;31:504–508.	Wrong focus
52. O’Beirne M, Sterling P, Palacios-Derflinger L, et al. Emotional impact of patient safety incidents on family physicians and their office staff. <i>J Am Board Fam Med</i> . 2012;25:177–183.	Mixed population
53. Oshikoya KA, Oreagba IA, Ogunleye OO, et al. Medication administration errors among paediatric nurses in Lagos public hospitals: an opinion survey. <i>Int J Risk Saf Med</i> . 2013;25:67–78.	Wrong focus
54. Panella M, Rinaldi C, Leigheb F, et al. The determinants of defensive medicine in Italian hospitals: the impact of being a second victim. <i>Rev Calid Asist</i> . 2016;31Suppl2:20–25.	Wrong focus
55. Paulsen PME, Brattebø G. Medisinstudentar og legar sine haldningar til medisinske feil og pasientskade. <i>Tidsskr Nor Lægeforen</i> . 2006;126:2129–132. Norwegian.	Wrong focus

56. Petrova E. Nurses' perceptions of medication errors in Malta. <i>Nurs Stand.</i> 2010;24:41–48.	Wrong focus
57. Pratt SD, Jachna BR. Care of the clinician after an adverse event. <i>Int J Obstet Anesth.</i> 2015;24:54–63.	Mismatch with the inclusion criteria
58. Pronovost PJ, Biennu OJ. A piece of my mind. From shame to guilt to love. <i>JAMA.</i> 2015;314:2507–2508.	Mismatch with the inclusion criteria
59. Quillivan RR, Burlison JD, Browne EK, et al. Patient safety culture and the second victim phenomenon: connecting culture to staff distress in nurses. <i>Jt Comm J Qual Patient Saf.</i> 2016;42:377–386.	Wrong focus
60. Ramirez AJ, Graham J, Richards MA, et al. Burnout and psychiatric disorder among cancer clinicians. <i>Br J Cancer.</i> 1995;71:1263–1269.	Wrong focus
61. Raymond CB, Woloschuk DM, Honcharik N. Attitudes and behaviours of hospital pharmacy staff toward near misses. <i>Healthc Q.</i> 2011;14:48–56.	Wrong focus
62. Rinaldi C, Leigheb F, Vanhaecht K, et al. Becoming a “second victim” in health care: pathway of recovery after adverse event. <i>Rev Calid Asist.</i> 2016;31Suppl2:11–19.	Mismatch with the inclusion criteria
63. Rivera EY, Lee C, Bernstein PS, et al. “Second victim” experiences in obstetrics and Gynecology [339] [abstract]. <i>Obstet Gynecol.</i> 2015; 125:107S.	No sufficient information
64. Robertson JH, Thomason AM. An exploration of the effects of clinical negligence litigation on the practice of midwives in England: a phenomenological study. <i>Midwifery.</i> 2016;33:55–63.	Mismatch with the inclusion criteria
65. Rodriguez J, Scott DS. When Clinicians drop out and start over after adverse events. <i>Jt Comm J Qual Patient Saf.</i> 2018; 44:137–145.	Mixed population
66. Santos AE, Padilha KG. [Medication adverse events in emergency department: nurse's professional conduct and personal feelings]. <i>Rev Bras Enferm.</i> 2005;58:429–433. Portuguese.	Wrong focus
67. Schelbred AB, Nord R. Nurses' experiences of drug administration errors. <i>J Adv Nurs.</i> 2007;60:317–324.	Mismatch with the inclusion criteria
68. Schiess C, Schwappach D. Healthcare professionals as second victims of adverse events. <i>Internistische Praxis.</i> 2018; 58:647–657. Mediengruppe Oberfranken Fachverlage.	Full-text not available.
69. Schröder K, Larsen PV, Jørgensen JS, et al. Psychosocial health and well-being among obstetricians and midwives involved in traumatic childbirth. <i>Midwifery.</i> 2016;41:45–53.	No sufficient information
70. Schröder K, Edrees HH, Christensen RD, et al. Second victims in the labor ward: Are Danish midwives and obstetricians getting the support they need? <i>Int J Qual Health Care.</i> 2018. doi:10.1093/intqhc/mzy219. [Epub ahead of print]	No sufficient information

71. Scott SD, Hirschinger LE, Cox KR, et al. Caring for our own: deploying a systemwide second victim rapid response team. <i>Jt Comm J Qual Patient Saf.</i> 2010;36:233–240.	Wrong focus
72. Shanafelt TD, Balch CM, Bechamps G, et al. Burnout and medical errors among American surgeons. <i>Ann Surg.</i> 2010;251:995–1000.	Wrong focus
73. Stangierski A, Warmuz-Stangierska I, Ruchala M, et al. Medical errors – not only patients’ problem. <i>Arch Med Sci.</i> 2012;8:569–574.	Wrong focus
74. Taylor D, Hassan MA, Luterman A, et al. Unexpected intraoperative patient death: the imperatives of family-and surgeon-centered care. <i>Arch Surg.</i> 2008;143:87–92.	Mismatch with the inclusion criteria
75. Teng CI, Chang SS, Hsu KH. Emotional stability of nurses: impact on patient safety. <i>J Adv Nurs.</i> 2009; 65:2088–2096.	Wrong focus
76. Theorell T. [Many physicians feel distressed after committing Medical errors. Two thirds worried about committing new errors, according to a North American survey]. <i>Lakartidningen.</i> 2008;105:610–1. Swedish.	Full-text not available
77. Tipton DJ, Giannetti VJ, Kristofik JM. Managing the aftermath of medication errors: managed care’s role. <i>J Am Pharm Assoc.</i> 2003;43:622–628.	Mismatch with the inclusion criteria
78. Torppa MA, Kuikka L, Nevalainen M, et al. Emotionally exhausting factors in general practitioners’ work. <i>Scand J Prim Health Care.</i> 2015;33:178–183.	Wrong focus
79. Tsiga E, Panagopoulou E, Montgomery A. Examining the link between burnout and medical error: a checklist approach. <i>Burnout Research.</i> 2017; 6:1-8.	Wrong focus
80. Treiber L, Jones J. After the medication error: recent nursing graduates’ reflections on adequacy of education. <i>J Nurs Educ Pract.</i> 2018; 57:275-280.	Full-text not available
81. Treiber LA, Jones JH. Making an infusion error: the second victims of infusion therapy-related medication errors. <i>J Infus Nurs.</i> 2018;41:156-163.	Mismatch with the inclusion criteria
82. Ugur E, Kara S, Yildirim S, et al. Medical errors and patient safety in the operating room. <i>J Pak Med Assoc.</i> 2016;66:593–597.	Wrong focus
83. Van Gerven E, Seys D, Panella M, et al. Involvement of health-care professionals in an adverse event: the role of management in supporting their workforce. <i>Pol Arch Med Wewn.</i> 2014;124:313–320.	Wrong focus
84. Van Gerven E, Bruyneel L, Panella M, et al. Psychological impact and recovery after involvement in a patient safety incident: a repeated measures analysis. <i>BMJ Open.</i> 2016;6:e011403.	No frequency of coping strategies reported
85. Varughese E, Janda M, Obermair A. Can the use of quality assurance tools reduce the impact of surgical complications on the well-being of obstetricians and gynaecologists in Australia and New Zealand. <i>Aust N Z J Obstet Gynaecol.</i> 2014;54:30–35.	Wrong focus

86. Venus E, Galam E, Aubert JP, et al. Medical errors reported by French general practitioners in training: results of a survey and individual interviews. <i>BMJ Qual Saf.</i> 2012;21:279–286.	Mismatch with the inclusion criteria
87. Vohra PD, Johnson JK, Daugherty CK, et al. Housestaff and medical student attitudes toward medical errors and adverse events. <i>Jt Common J Qual Patient Saf.</i> 2007;33:493–501.	Wrong focus
88. Wahlberg A, Andreen Sachs M, Johannesson K, et al. Post-traumatic stress symptoms in Swedish obstetricians and midwives after severe obstetric events: a cross-sectional retrospective survey. <i>BJOG.</i> 2017;124:1264–1271.	Mixed population
89. Wahlberg A, Andreen Sachs M, Bergh Johannesson K, et al. Self-reported exposure to severe events on the labour ward among Swedish midwives and obstetricians: a cross-sectional retrospective study. <i>Int J Nurs Stud.</i> 2017;65:8–16.	Wrong focus
90. Waterman AD, Garbutt J, Hazel E, et al. The emotional impact of medical errors on practicing physicians in the United States and Canada. <i>Jt Comm J Qual Patient Saf.</i> 2007;33:467–476.	Wrong focus
91. West CP, Huschka MM, Novotny PJ, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. <i>JAMA.</i> 2006;296:1071–1078.	No sufficient information
92. White AA, Gallagher TH, Krauss MJ, et al. The attitudes and experiences of trainees regarding disclosing medical errors to patients. <i>Acad Med.</i> 2008;83:250–256.	Wrong focus
93. Winning AM, Merandi JM, Lewe D, et al. The emotional impact of errors or adverse events on healthcare providers in the NICU: The protective role of coworker support. <i>J Adv Nurs.</i> 2018;74:172–180.	Wrong focus
94. Wolf ZR, Serembus JF, Smetzer J, et al. Responses and concerns of healthcare providers to medication errors. <i>Clin Nurse Spec.</i> 2000;14:278–287.	Wrong focus
95. Wu AW, Folkman S, McPhee, SJ, et al. Do house officers learn from their mistakes? <i>Qual Saf Health Care.</i> 2003;12:221–228.	Reprint of the paper published in JAMA, 1991, Volume 265, pages 2089–94.
96. Wurst FM, Kunz I, Skipper G, et al. The therapist's reaction to a patient's suicide: results of a survey and implications for health care professionals' well-being. <i>Crisis.</i> 2011;32:99–105.	No sufficient information
97. Xiang D, Linos D. Supporting the patient through supporting the surgeon involved in an adverse event and/or medical litigation. <i>Surgery.</i> 2018;164:176–177.	Mismatch with the inclusion criteria

## Supplemental Data File 6

### Critical appraisal results for the included studies using the JBI Critical Appraisal Checklist for Prevalence Studies

	1. Appropriate sample frame to address target population	2. Appropriate way of sampling	3. Adequate sample size	4. Description of study subjects and setting in detail	5. Data Analysis with sufficient coverage of the identified sample	6. Use of valid methods for identifying the condition	7. Measurement of condition in standard, reliable way	8. Appropriate statistical analysis	9. Adequate response rate or, if not, appropriate management of low response rate	Absolute number of criteria met
Chard (2010)	✓	✓	✓	✓	✓	✓	✓	✓	?	8
Cramer, Foraita, Habermann (2012)	✓	✓	✓	✓	✓	?	✓	✓	✓	8
Dhillon, Russell, Stiegler (2015)	✓	✓	?	✓	✓	X	✓	✓	?	6
Gazoni, Amato, Malik, et al. (2012)	✓	✓	✓	✓	✓	?	✓	X	✓	7
Harrison, Lawton, Stewart (2014)	✓	✓	✓	✓	✓	?	✓	✓	✓	8
Hobgood, Hevia, Tamayo-Sarver, et al. (2005)	✓	X	?	✓	✓	?	✓	X	✓	5
Joesten, Cipparrone, Okuno-Jones, et al. (2015)	✓	X	?	?	✓	?	✓	✓	✓	5
Karga, Klekkas, Aretha, et al. (2011)	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Meurier, Vincent, Parmar (1997)	✓	?	?	X	✓	✓	✓	✓	✓	6
Nevalainen, Kuikka, Pitkälä (2014)	✓	X	?	✓	✓	?	✓	✓	✓	6
Schröder, Jørgensen, Lamont, et al. (2016)	✓	✓	✓	✓	✓	?	✓	✓	✓	8
Taifoori, Valiee (2015)	✓	✓	✓	✓	✓	?	✓	✓	✓	8
Van Gerven, Elst, Vandenbroeck, et al. 2016	✓	X	✓	✓	✓	?	✓	✓	X	6
Wu, Folkman, McPhee, et al. (1991)	✓	✓	?	✓	✓	✓	✓	✓	✓	8

✓ = Yes; X = No; ? = Unsure

## Supplemental Data File 7

### Characteristics of included studies

Authors	Year	Country	Study design	Setting	Sample size of healthcare providers involved in an adverse event	Adverse event (type, severity, outcomes)	Coping strategies (number of participants applying the respective coping strategy)
Chard	2010	USA	Cross-sectional study design applying descriptive and inferential statistics; paper-and-pencil, self-report "Perioperative Nurse Questionnaire" (developed by the author, closed-ended questions)	Perioperative nursing	158	Intraoperative nursing errors (e.g., unclear about surgical site, break in sterile technique)	<ul style="list-style-type: none"> <li>- Changing work attitude (n=146)</li> <li>- Following policies and guidelines more accurately and closely (n=119)</li> <li>- Paying more attention to detail (n=156)</li> <li>- Problem-solving/concrete action plan (n=143)</li> <li>- Criticizing or lecturing oneself (n=133)</li> <li>- Better monitoring or the patient/paying better attention to the patient (n=96)</li> <li>- Apologizing or doing something to make up (n=96)</li> <li>- Disclosing the error/talking to/support from (unspecified) person (n=101)</li> <li>- Seeking (more) advice from colleagues and senior staff (n=93)</li> <li>- Emotional self-control (n=131)</li> <li>- Wishing the situation away (n=67)</li> <li>- Working more slowly and carefully (n=101)</li> <li>- Disclosing the error to/talking to/ support from friends/partner/family (n=38)</li> <li>- Trusting others less (n=83)</li> <li>- Distancing (n=61)</li> <li>- Trying to hide error/refusing to talk about it (n=42)</li> <li>- Avoidance of patients, procedures, situations (n=15)</li> <li>- Turnover intentions (n=25)</li> </ul>
Cramer, Foraita, Habermann	2012	Germany	Cross-sectional study design applying descriptive and inferential statistics; paper-and-pencil, self-report questionnaire (developed by the research team, closed-ended and open-ended questions)	Inpatient care (also pediatric and geriatric care) (not further specified)	1,100	Nursing errors (not further specified)	<ul style="list-style-type: none"> <li>- Positive reappraisal (n=268)</li> </ul>
Dhillon, Russell, Stiegler	2015	USA	Cross-sectional study design applying	Anesthesiology	245	Perioperative errors (e.g., drug error) resulting in, for	<ul style="list-style-type: none"> <li>- Disclosing the error to/talking to/support from medical staff (n=144)</li> </ul>

			descriptive and inferential statistics; web-based, self-report questionnaire (developed by the research team, closed-ended and open-ended questions)			example, venous air embolism, anoxic brain injury, anaphylaxis or death	<ul style="list-style-type: none"> <li>- <i>Disclosing the error and talking to the patient and the family (n=125)</i></li> <li>- <i>Use of alcohol/drugs/medication (n=13)</i></li> </ul>
Gazoni Amato, Malik, et al.	2012	USA	Cross-sectional study design applying descriptive statistics; paper-and-pencil, self-report questionnaire (developed by the research team, closed-ended and open-ended questions)	Anesthesiology	570	Perioperative catastrophe, resulting in, for example, serious injury or even death	<ul style="list-style-type: none"> <li>- <i>Disclosing the error to/talking to/support from medical staff (n=535)</i></li> <li>- <i>Disclosing the error to/talking to/support from friends/partner/family (n=410)</i></li> <li>- <i>Turnover intentions (n=68)</i></li> <li>- <i>Use of alcohol/drugs/medication (n=28)</i></li> </ul>
Harrison, Lawton, Stewart	2014	UK	Cross-sectional study design applying descriptive statistics; web-based, self-report questionnaire (modified version of the questionnaire used by Waterman <i>et al.</i> , closed-ended questions)	Internal medicine	1,463	Adverse events (not further specified) with serious or minor patient harm; Near misses with potential for serious or minor patient harm)	<ul style="list-style-type: none"> <li>- <i>Changing work attitude (n=1179)</i></li> <li>- <i>Positive reappraisal (n=110)</i></li> </ul>
Hobgood, Helvia, Tamayo-Sarver, et al.	2005	USA	Cross-sectional study design, applying descriptive and inferential statistics; paper-and-pencil, self-report questionnaire (developed by the research team, closed-ended and open-ended questions)	Emergency care	40	Medication errors, diagnostic errors, evaluation and treatment errors, procedural errors, communication errors, leading to adverse outcomes, such as physical discomfort, increased length of stay, clinical deterioration or even death.	<ul style="list-style-type: none"> <li>- <i>Changing work attitude (n=36)</i></li> <li>- <i>Paying more attention to detail (n=32)</i></li> <li>- <i>Disclosing the error to/talking to/support from medical staff (n=27)</i></li> <li>- <i>Disclosing the error/talking to/support from (unspecified) person (n=33)</i></li> <li>- <i>Personally confirming data (n=20)</i></li> <li>- <i>Seeking (more) advice from colleagues and senior staff (n=14)</i></li> <li>- <i>Disclosing the error to/talking to/support from friends/partner/family (n=19)</i></li> <li>- <i>Trusting others less (n=12)</i></li> <li>- <i>Disclosing the error and talking to the patient and the family (n=10)</i></li> <li>- <i>Reading more (n=11)</i></li> <li>- <i>Changing one's data organization (n=4)</i></li> <li>- <i>Ordering more tests (n=5)</i></li> <li>- <i>Trying to hide error/refusing to talk about it (n=2)</i></li> <li>- <i>Avoidance of patients, procedures, situations (n=2)</i></li> </ul>

Joesten, Cipparrone, Okuno-Jones, et al.	2015	USA	Cross-sectional study design applying descriptive statistics; web-based, modified version of the self-report "Medically Induced Trauma Support Services Staff Support Survey" (closed-ended questions)	Inpatient care (also pediatric care)	120	Adverse events (not further specified) leading to negative patient outcomes	<ul style="list-style-type: none"> <li>- <i>Disclosing the error to/talking to/support from medical staff (n=77)</i></li> <li>- <i>Disclosing the error to/talking to/support from friends/partner/family (n=68)</i></li> <li>- <i>Disclosing the error and talking to the patient and the family(n=53)</i></li> <li>- <i>Turnover intentions (n=24)</i></li> </ul>
Karga, Kiekkas, Aretha, et al.	2011	Greece	Cross-sectional study design applying descriptive and inferential statistics; paper-and-pencil, self-report questionnaire (modified version of the questionnaire by Wu et al.[53] and Meurier et al.,[48] respectively; closed-ended and open-ended questions)	Different hospital departments (e.g., Hemodialysis, surgery, intensive care)	536	Medication errors, errors linked to haemodialysis practices, surgical practices, or other tasks (e.g., documentation and blood transfusion),error severity was perceived as high, medium, low or none; adverse outcomes included need for additional therapeutic interventions and monitoring and patient death.	<ul style="list-style-type: none"> <li>- <i>Paying more attention to detail (n=367)</i></li> <li>- <i>Problem-solving/concrete action plan (n=319)</i></li> <li>- <i>Disclosing the error to/talking to/support from medical staff (n=271)</i></li> <li>- <i>Better monitoring of the patient/paying better attention to the patient (n=271)</i></li> <li>- <i>Apologizing or doing something to make up (n=435)</i></li> <li>- <i>Disclosing the error/talking to/support from (unspecified) person (n=390)</i></li> <li>- <i>Seeking (more) advice from colleagues and senior staff (n=258)</i></li> <li>- <i>Emotional self-control (n=248)</i></li> <li>- <i>Trusting others less (n=192)</i></li> <li>- <i>Reading more (n=146)</i></li> <li>- <i>Distancing (n=120)</i></li> <li>- <i>Trying to hide error/refusing to talk about it (n=133)</i></li> <li>- <i>Avoidance of patients, procedures, situations (n=165)</i></li> <li>- <i>Turnover intentions (n=20)</i></li> </ul>
Meurier, Vincent, Parmar	1997	UK	Cross-sectional study design applying descriptive and inferential statistics; paper-and-pencil, self-report questionnaire (modified version of the questionnaire by Wu et al.,[53] closed-ended and open-ended questions)	Different hospital departments (not further specified)	129	Errors related to communication, assessment, planning, intervention and evaluation with no consequences, mild, moderate or severe effects	<ul style="list-style-type: none"> <li>- <i>Paying more attention to detail (n=108)</i></li> <li>- <i>Problem-solving/concrete action plan (n=80)</i></li> <li>- <i>Disclosing the error to/talking to/support from medical staff (n=85)</i></li> <li>- <i>Better monitoring of the patient/paying better attention to the patient (n=68)</i></li> <li>- <i>Apologizing or doing something to make up (n=87)</i></li> <li>- <i>Disclosing the error/talking to/support from (unspecified) person (n=32)</i></li> <li>- <i>Seeking (more) advice from colleagues and senior staff (n=64)</i></li> <li>- <i>Emotional self-control (n=248)</i></li> <li>- <i>Wishing the situation away (n=50)</i></li> <li>- <i>Disclosing the error/talking to/support from friends/partner/family (n=30)</i></li> <li>- <i>Trusting others less (n=43)</i></li> <li>- <i>Disclosing the error and talking to the patient and the family (n=30)</i></li> <li>- <i>Distancing (n=20)</i></li> </ul>

							- Trying to hide error/refusing to talk about it (n=24)
Nevalainen, Kuikka, Pitkälä	2014	Finland	Cross-sectional study design applying descriptive and inferential statistics; web-based, self-report questionnaire (developed by the research team; closed-ended questions)	General medicine	165	Not specified.	<ul style="list-style-type: none"> <li>- Disclosing the error to/talking to/support from medical staff (n=107)</li> <li>- Disclosing the error and talking to the patient and the family (n=107)</li> <li>- Trying to hide error/refusing to talk about it (n=7)</li> </ul>
Schrøder, Jørgensen, Lamont, et al.	2016	Denmark	Cross-sectional mixed-method study design applying descriptive statistics; Self-report questionnaire with closed-ended questions & semi-structured interviews, (developed by the research team)	Midwifery, Obstetrics	1,027*	Traumatic childbirth with fatal outcome, severe or permanent injuries for infant or mother	<ul style="list-style-type: none"> <li>- Positive reappraisal (n=404)</li> <li>- Turnover intentions (n=234)</li> </ul>
Taifoori & Valiee	2015	Iran	Cross-sectional study design applying descriptive statistics; paper-and-pencil, self-report questionnaire ("Perioperative Nurse Questionnaire", closed-ended questions)	Perioperative nursing	153	Perioperative errors (e.g., Not following sterile technique, incorrect counts of surgical gauze, incorrect counts of surgical tools, leaving a foreign body in the patient)	<ul style="list-style-type: none"> <li>- Changing work attitude (n=149)</li> <li>- Following policies and guidelines more accurately and closely (n=146)</li> <li>- Paying more attention to detail (n=150)</li> <li>- Problem-solving/concrete action plan (n=133)</li> <li>- Better monitoring of the patient/paying better attention to the patient (n=146)</li> <li>- Apologizing or doing something to make up (n=131)</li> <li>- Disclosing the error/talking to/support from (unspecified) person (n=114)</li> <li>- Seeking (more) advice from colleagues and senior staff (n=140)</li> <li>- Wishing the situation away (n=122)</li> <li>- Working more slowly and carefully (n=66)</li> <li>- Disclosing the error to/talking to/support from friends/partner/family (n=98)</li> <li>- Trusting others less (n=48)</li> <li>- Distancing (n=59)</li> <li>- Trying to hide error/refusing to talk about it (n=59)</li> <li>- Avoidance of patients, procedures, situations (n=54)</li> <li>- Turnover intentions (n=32)</li> </ul>

Van Gerven, Elst, Vandenbroeck, et al.	2016	Belgium	Cross-sectional study design applying descriptive and inferential statistics; different self-report questionnaires (validated scales, such as the "Utrechtse Burnout Schaal",[54] and scales developed by the research team; closed-ended and open-ended questions)	Inpatient care (acute and psychiatric care; not further specified)	531	Severity of the adverse events (not further specified) resulting in no harm, temporary or permanent harm or even death.	- <i>Use of alcohol/drugs/medication (n=107)</i>
Wu, Folkman, McPhee, et al.	1991	USA	Cross-sectional study design applying descriptive and inferential statistics; paper-and-pencil, self-report questionnaire (developed by the research team, closed-ended and open-ended questions)	Internal medicine	114	Errors in diagnosis, evaluation and treatment, prescribing and dosing, procedural complications, faulty communication with overwhelmingly serious adverse outcomes (e.g., delayed treatment, stroke, amputation, respiratory failure, death)	<ul style="list-style-type: none"> <li>- <i>Changing work attitude (n=86)</i></li> <li>- <i>Paying more attention to detail (n=93)</i></li> <li>- <i>Criticizing or lecturing oneself (n=70)</i></li> <li>- <i>Disclosing the error to/talking to/support from medical staff (n=100)</i></li> <li>- <i>Apologizing or doing something to make up (n=23)</i></li> <li>- <i>Disclosing the error/talking to/support from (unspecified) person (n=66)</i></li> <li>- <i>Personally confirming data (n=82)</i></li> <li>- <i>Seeking (more) advice from colleagues and senior staff (n=71)</i></li> <li>- <i>Trusting others less (n=56)</i></li> <li>- <i>Disclosing the error and talking to the patient and the family (n=27)</i></li> <li>- <i>Reading more (n=62)</i></li> <li>- <i>Changing one's data organization (n=59)</i></li> <li>- <i>Ordering more tests (n=29)</i></li> <li>- <i>Trying to hide error/refusing to talk about it (n=15)</i></li> <li>- <i>Avoidance of patients, procedures, situations (n=7)</i></li> </ul>

Notes. \*We used for the meta-analyses slightly varying sample sizes according to the respective variable of interest (n<sub>1</sub>= 1019, n<sub>2</sub>=1022, n<sub>3</sub>=1024).

## **Supplemental Data File 8**

### **Grouped variables of interest**

(listed according to the overall frequency of the applied coping strategies)

#### **Changing work attitude**

- *I promised to do things differently next time* (Chard, 2010)
- *Determined to improve (eg feeling determined, resourceful or strong)* (Harrison, Lawton, Stewart, 2014)
- *Self-critical of the performance and promising to do things differently next time* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Making the decision to do better next time* (Taifoori & Valiee, 2015)
- *Promising to do things differently next time* (Wu, Folkman, McPhee, et al., 2003)

#### **Following policies and guidelines more accurately and closely**

- *I follow policies and procedures more closely* (Chard, 2010)
- *Following guidelines and procedures more accurately* ( Taifoori & Valiee, 2015)

#### **Paying more attention to detail**

- *I pay more attention to detail* (Chard, 2010)
- *Pay more attention to details* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Paying more attention to detail* (Karga, Kiekkas, Aretha, et al., 2011)
- *Paying more attention to detail* (Meurier, Vincent, Parmar, 1997)
- *Paying more attention to detail* (Taifoori & Valiee, 2015)
- *Pay more attention to detail* (Wu, Folkman, McPhee, et al., 2003)

#### **Problem-solving/concrete action plan**

- *I made a plan of action and followed it* (Chard, 2010)
- *Planful problem solving* (Karga, Kiekkas, Aretha, et al., 2011)
- *Taking steps to make oneself less liable to make errors* (Meurier, Vincent, Parmar, 1997)
- *Creating a new plan and following it next time* (Taifoori & Valiee, 2015)

#### **Criticizing or lecturing oneself**

- *I criticized or lectured myself* (Chard, 2010)
- *Critizing or lecturing oneself* (Wu, Folkman, McPhee, et al., 2003)

#### **Disclosing the error to/talking to/support from medical staff**

- *Talking with colleagues* (Dhillon, Russell, Stiegler, 2015)
- *Anesthesia personnel as source of postevent support* (Gazoni, Amato, Malik, et al., 2012)
- *Disclosure to attending responsible for patient* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *My clinical colleagues provided meaningful and sustained support after the event* (Joesten, Cipparrone, Okuno-Jones, et al., 2015)
- *Support from senior staff* (Karga, Kiekkas, Aretha, et al., 2011)
- *Discuss error with colleagues* (Meurier, Vincent, Parmar, 1997)
- *Has told the supervisor/a colleague* (Nevalainen, Kuikka, Pitkälä, 2014)
- *Discussed the mistake with another physician who was not in a supervisory capacity* (Wu, Folkman, McPhee, et al., 2003)

#### **Better monitoring of the patient/paying better attention to the patient**

- *I keep better documentation on the patients* (Chard, 2010)
- *Devote more observation on patients* (Karga, Kiekkas, Aretha, et al., 2011)
- *Keeping better records on patients* (Meurier, Vincent, Parmar, 1997)

- *Listening to patients more carefully* (Taifoori & Valiee, 2015)

#### **Apologizing or doing something to make up**

- *Apologized or did something to make up* (Chard, 2010)
- *Accepting responsibility* (Karga, Kiekkas, Aretha, et al., 2011)
- *Accepting responsibility* (Meurier, Vincent, Parmar, 1997)
- *Apologizing* (Taifoori & Valiee, 2015)
- *Apologizing or doing something to make up* (Wu, Folkman, McPhee, et al., 2003)

#### **Disclosing the error/talking to/support from (unspecified) person**

- *I talked to someone about how I was feeling* (Chard, 2010)
- *Disclosure to anyone* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Seeking social support* (Karga, Kiekkas, Aretha, et al., 2011)
- *Talked to someone about how I was feeling* (Meurier, Vincent, Parmar, 1997)
- *Talking with others about one's feelings* (Taifoori & Valiee, 2015)
- *Talking to a non-medical person about the mistake* (Wu, Folkman, McPhee, et al., 2003)

#### **Personally confirming data**

- *Personally confirm data* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Personally confirm data* (Wu, Folkman, McPhee, et al., 2003)

#### **Seeking (more) advice from colleagues and senior staff**

- *I am more likely to seek advice* (Chard, 2010)
- *Seeking more advice from senior staff* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Asking colleagues what they would have done in a similar situation* (Karga, Kiekkas, Aretha, et al., 2011)
- *Asking colleagues what they would have done in a similar situation* (Meurier, Vincent, Parmar, 1997)
- *Asking colleagues about their actions in the same situation* (Taifoori & Valiee, 2015)
- *Seek more advice* (Wu, Folkman, McPhee, et al., 2003)

#### **Emotional self-control**

- *I tried to keep my feelings from interfering with other things too much* (Chard, 2010)
- *Emotional self-control* (Karga, Kiekkas, Aretha, et al., 2011)
- *I tried to keep feelings to self* (Meurier, Vincent, Parmar, 1997)

#### **Wishing the situation away**

- *I wished the situation would go away or somehow be over* (Chard, 2010)
- *Wishing the whole thing would go away* (Meurier, Vincent, Parmar, 1997)
- *Hoping for the elimination of a situation or for it to not occur again* (Taifoori & Valiee, 2015)

#### **Working more slowly and carefully**

- *I slow down more* (Chard, 2010)
- *Working more slowly and carefully* (Taifoori & Valiee, 2015)

#### **Disclosing the error to/talking to/support from friends/partner/family**

- *I asked a relative or friend I respected for advice* (Chard, 2010)
- *Spouse, family, or friends as source of postevent support* (Gazoni, Amato, Malik, et al., 2012)
- *Disclosure to friend or spouse* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *My family and friends were the mainstay of my support after the event* (Joesten, Cipparrone, Okuno-Jones, et al. 2015)

- *Discussed the error with spouse or significant other* (Meurier, Vincent, Parmar, 1997)
- *Requesting support or advice from a friend* (Taifoori & Valiee, 2015)

### **Trusting others less**

- *I am less trusting of others' capability* (Chard, 2010)
- *Trust others' judgement less* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Trust others less* (Karga, Kiekkas, Aretha, et al., 2011)
- *Being less trusting of other people* (Meurier, Vincent, Parmar, 1997)
- *Less trust in others' capabilities* (Taifoori & Valiee, 2015)
- *Trust others' judgment less* (Wu, Folkman, McPhee, et al., 2003)

### **Disclosing the error and talking to the patient and the family**

- *Disclosure to family* (anesthesiologist) (Dhillon, Russell, Stiegler, 2015)
- *Disclosure to patient or patient's family* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *I had the opportunity to speak with the patient and/or family.* (Joesten, Cipparrone, Okuno-Jones, et al. 2015)
- *Patients or their relatives were told about the error* (Meurier, Vincent, Parmar, 1997)
- *Told the patient and explained* (Nevalainen, Kuikka, Pitkälä, 2014)
- *Told the patient or family* (Wu, Folkman, McPhee, et al., 2003)

### **Reading more**

- *Read more* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Read for covering knowledge deficiencies* (Karga, Kiekkas, Aretha, et al., 2011)
- *Read* (Wu, Folkman, McPhee, et al., 2003)

### **Distancing**

- *I didn't let it get to me, I refused to think about it too much* (Chard, 2010)
- *Distancing* (Karga, Kiekkas, Aretha, et al., 2011)
- *Went on as if nothing happened* (Meurier, Vincent, Parmar, 1997)
- *Trying to forget the whole incidence* (Taifoori & Valiee, 2015)

### **Changing one's data organization**

- *Have changed my organization of data* (Hobgood, Hevia, Tamayo-Sarver, et al. 2005)
- *Change organization of data* (Wu, Folkman, McPhee, et al., 2003)

### **Positive reappraisal**

- *Persönlich gewachsen* [engl.: *personally grown*] (Cramer, Foraita, Habermann, 2012)
- *More confident in your abilities (eg feeling effective, efficient or competent)* (Harrison, Lawton, Stewart, 2014)
- *The event gave rise to personal development opportunities of an emotional and/or spiritual character.* (Schröder, Jørgensen, Lamont, et al., 2016)

### **Ordering more tests**

- *Order more tests* (Hobgood, Hevia, Tamayo-Sarver, et al., 2005)
- *Order more tests* (Wu, Folkman, McPhee, et al., 2003)

### **Trying to hide error/refusing to talk about it**

- *I kept others from knowing how bad things were* (Chard, 2010)
- *Keep error to myself more often* (Hobgood, Hevia, Tamayo-Sarver, et al., 2005)
- *More likely to not discuss error* (Karga, Kiekkas, Aretha, et al., 2011)
- *Refusing to talk about it* (Meurier, Vincent, Parmar, 1997)

- *Has tried to hide an error* (Nevalainen, Kuikka, Pitkälä, 2014)
- *Trying to keep others from realizing the magnitude of the error or results* (Taifoori & Valiee, 2015)
- *Keep mistakes to self* (Wu, Folkman, McPhee, et al., 2003)

#### **Avoidance of patients, procedures, situations**

- *I try to avoid similar patients or procedures or both* (Chard, 2010)
- *Avoid similar patients* (Hobgood, Hevia, Tamayo-Sarver, et al., 2005)
- *Escape-avoidance* (Karga, Kiekkas, Aretha, et al., 2011)
- *Avoiding similar patients, procedures or both* (Taifoori & Valiee, 2015)
- *Avoid similar patients* (Wu, Folkman, McPhee, et al., 2003)

#### **Turnover intentions**

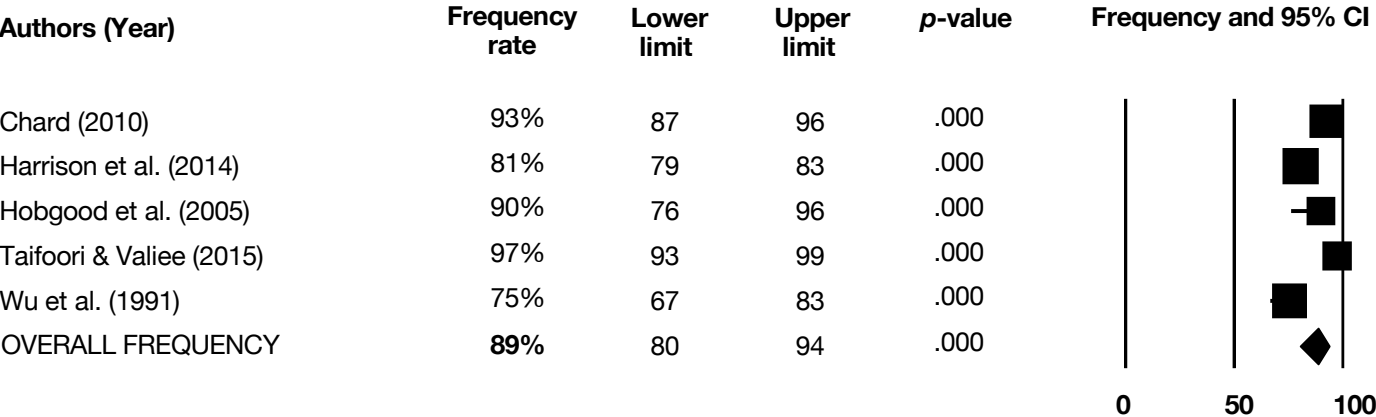
- *I thought about leaving nursing.* (Chard, 2010)
- *Considered a career change after the event* (Gazoni, Amato, Malik, et al., 2012)
- *I seriously considered moving to another institution because of the event or what happened afterwards* (Joesten, Cipparrone, Okuno-Jones, et al., 2015)
- *Considered leaving profession* (Karga, Kiekkas, Aretha, et al., 2011)
- *I considered leaving my profession because of the event* (Schröder, Jørgensen, Lamont, et al., 2016)
- *Thinking about leaving the job* (Taifoori & Valiee, 2005)

#### **Use of alcohol/drugs/medication**

- *Alcohol/self-medication* (Dhillon, Russell, Stiegler, 2015)
- *Use of drugs or alcohol* (Gazoni, Amato, Malik, et al., 2012)
- *Problematic medication use* (Van Gerven, Else, Vandenbroeck, et al. 2016)

Supplemental Data File 9  
Forest Plots of all performed meta-analyses

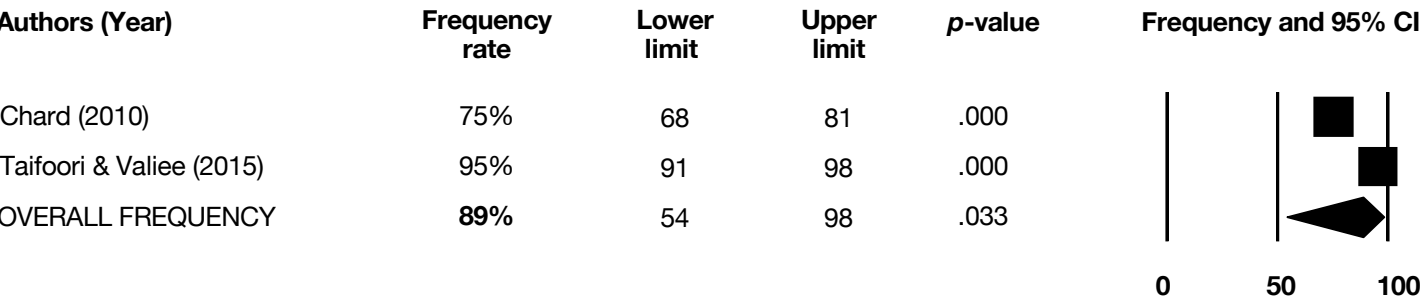
CHANGING WORK ATTITUDE



I<sup>2</sup>=40.5%

Meta Analysis

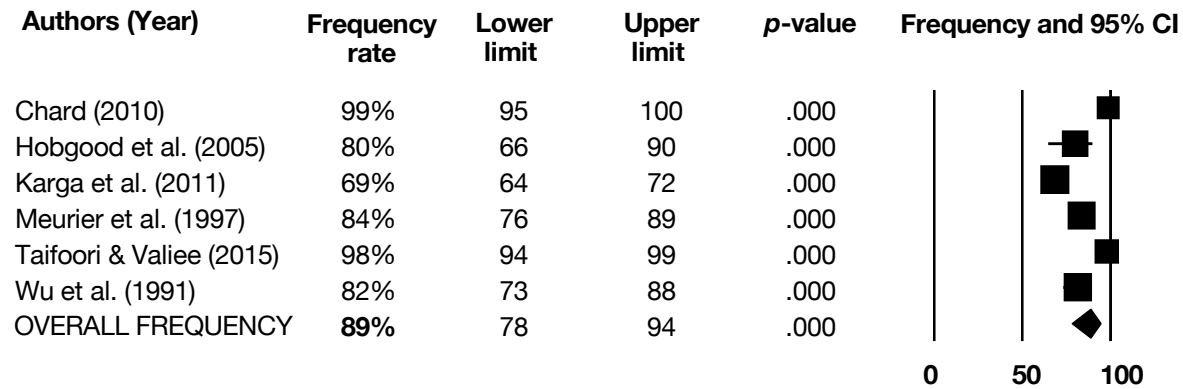
FOLLOWING POLICIES AND GUIDELINES MORE ACCURATELY AND CLOSELY



I<sup>2</sup>=0%

Meta Analysis

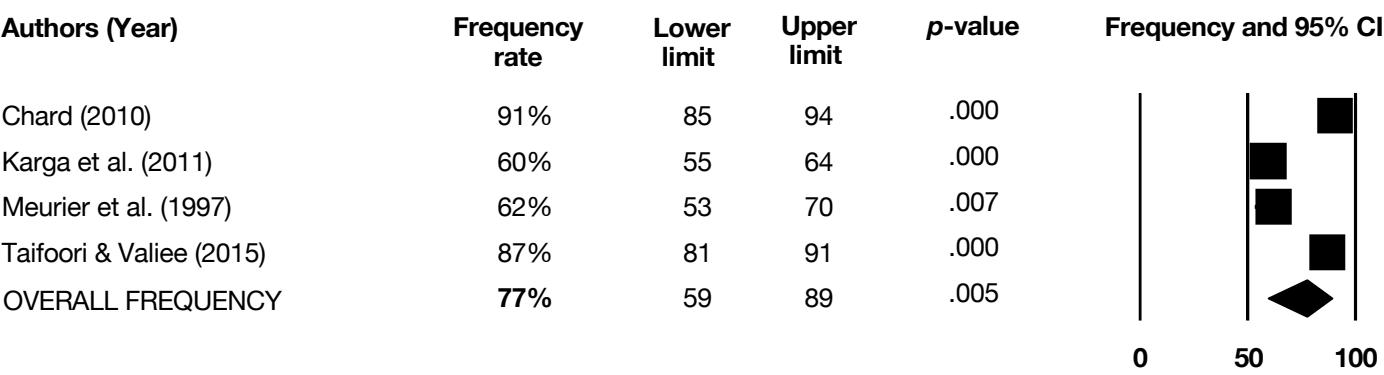
## PAYING MORE ATTENTION TO DETAIL



$I^2=51\%$

## Meta Analysis

PROBLEM-SOLVING/CONCRETE ACTION PLAN



$I^2=16.8\%$

Meta Analysis

## CRITIZING OR LECTURING ONESELF

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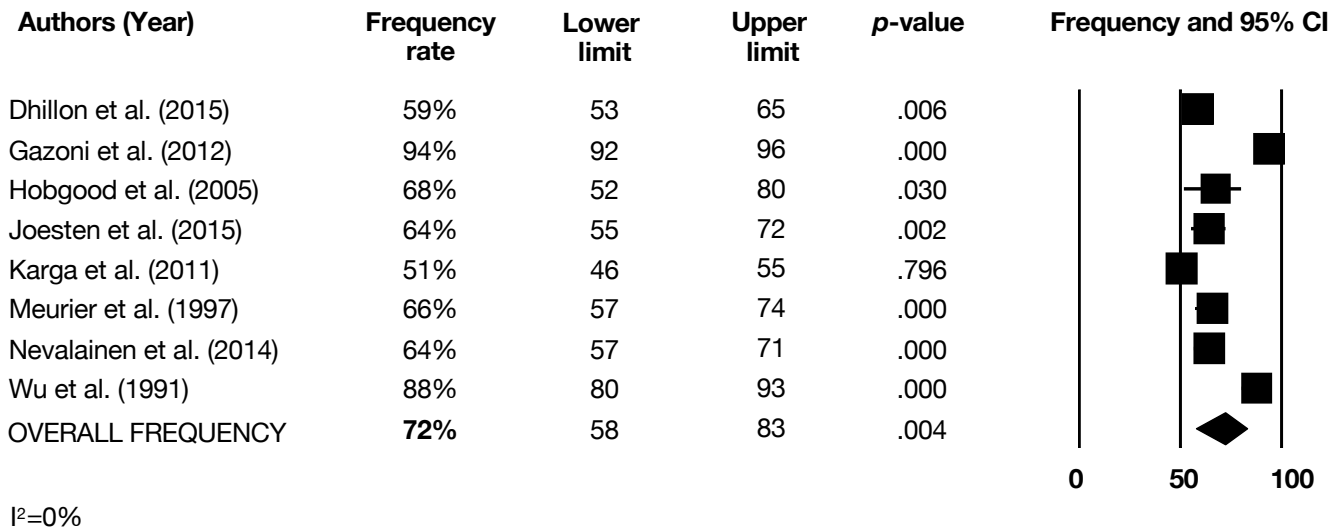
Authors (Year)	Frequency rate	Lower limit	Upper limit	<i>p</i> -value	Frequency and 95% CI
Chard (2010)	84%	78	89	.000	
Wu et al. (1991)	61%	52	70	.016	
OVERALL FREQUENCY	<b>74%</b>	47	90	.078	
					0      50      100

$I^2=0\%$

---

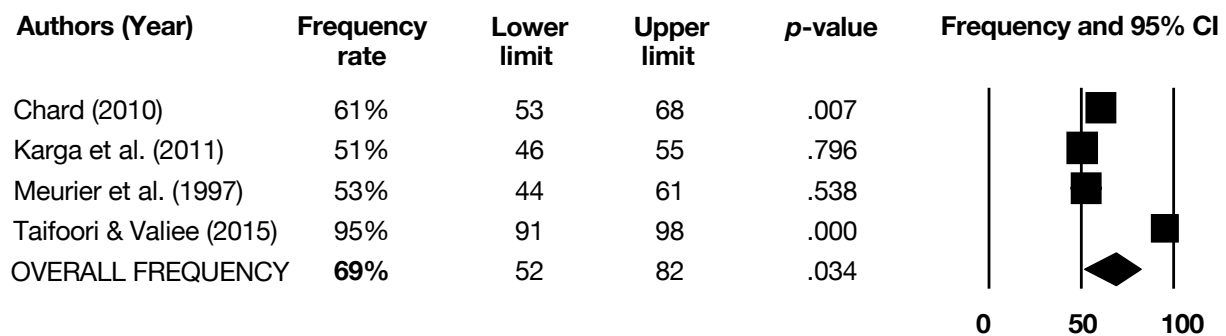
### Meta Analysis

DISCLOSING THE ERROR TO/TALKING TO/SUPPORT FROM MEDICAL STAFF



## BETTER MONITORING OF THE PATIENT/ PAYING BETTER ATTENTION TO THE PATIENT

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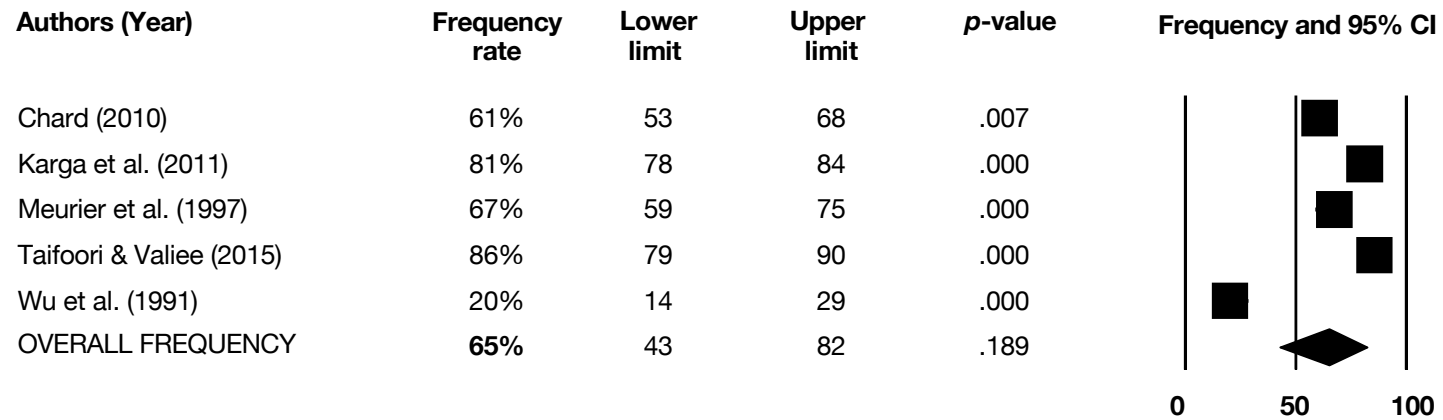
$I^2=69.8\%$

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### Meta Analysis

## APOLOGIZING OR DOING SOMETHING TO MAKE UP

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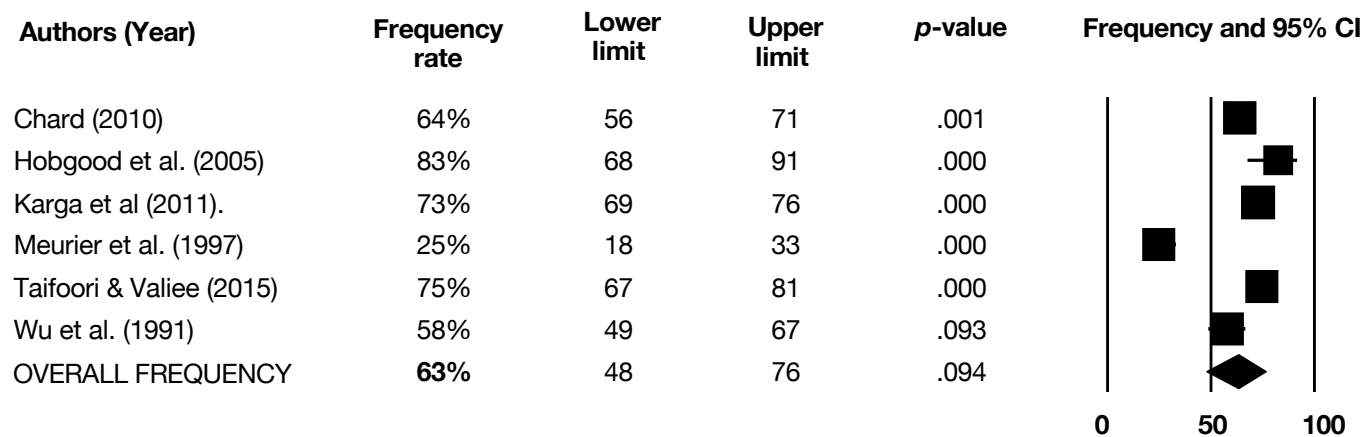


$I^2=27.5\%$

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### Meta Analysis

## DISCLOSING THE ERROR/TALKING TO/SUPPORT FROM (UNSPECIFIED) PERSON

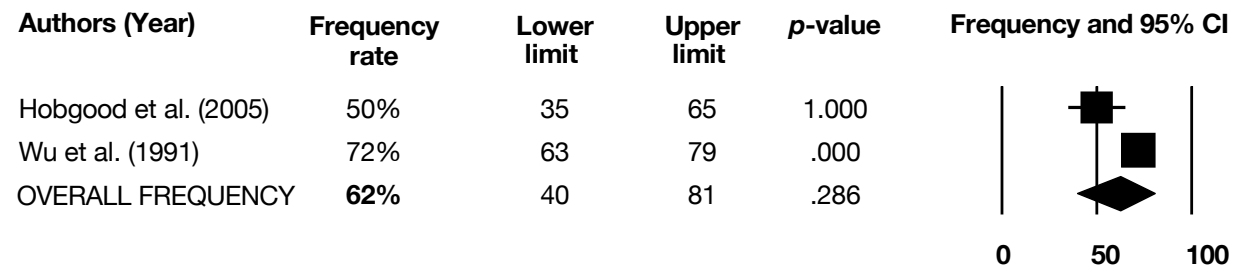


$I^2=25.1\%$

**Meta Analysis**

## PERSONALLY CONFIRMING DATA

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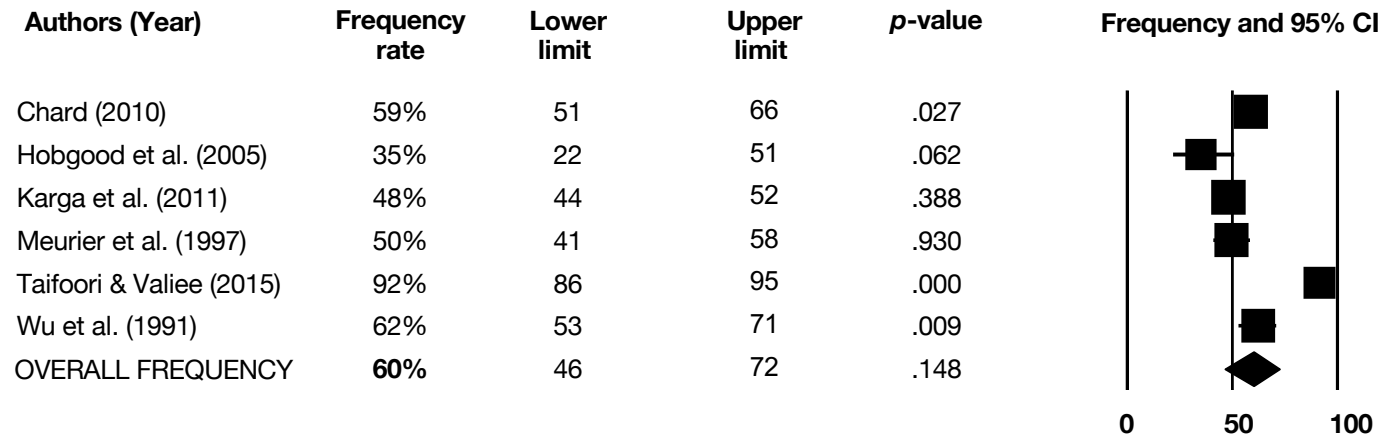
$I^2=0\%$

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### Meta Analysis

## SEEKING (MORE) ADVICE FROM COLLEAGUES AND SENIOR STAFF

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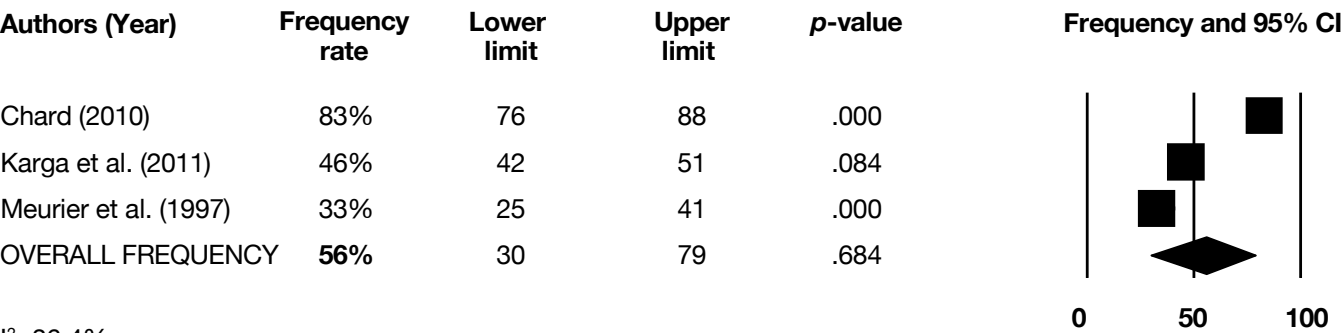


$I^2=52.1\%$

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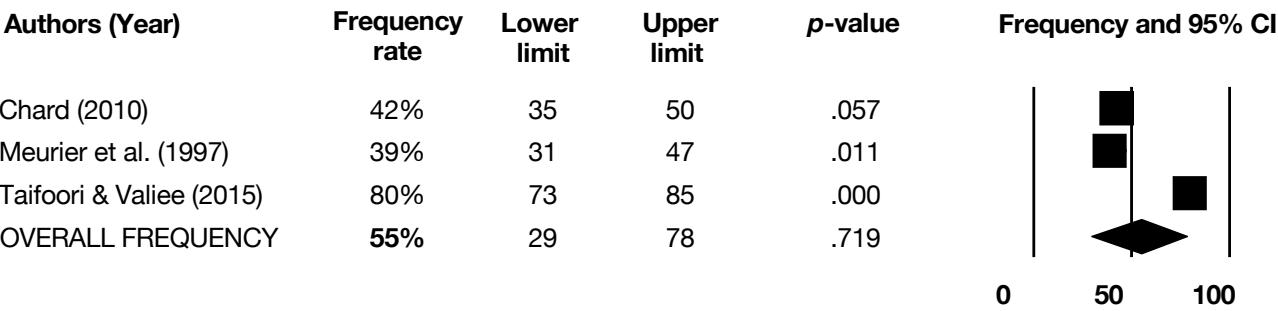
### Meta Analysis

EMOTIONAL SELF-CONTROL



Meta Analysis

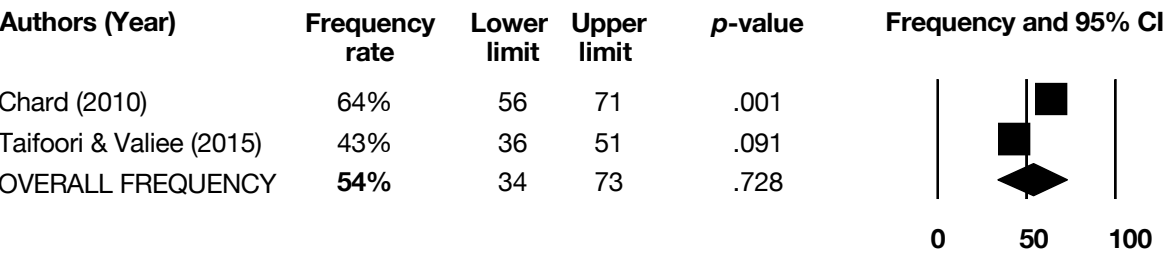
WISHING THE SITUATION AWAY



I<sup>2</sup>=11.6%

Meta Analysis

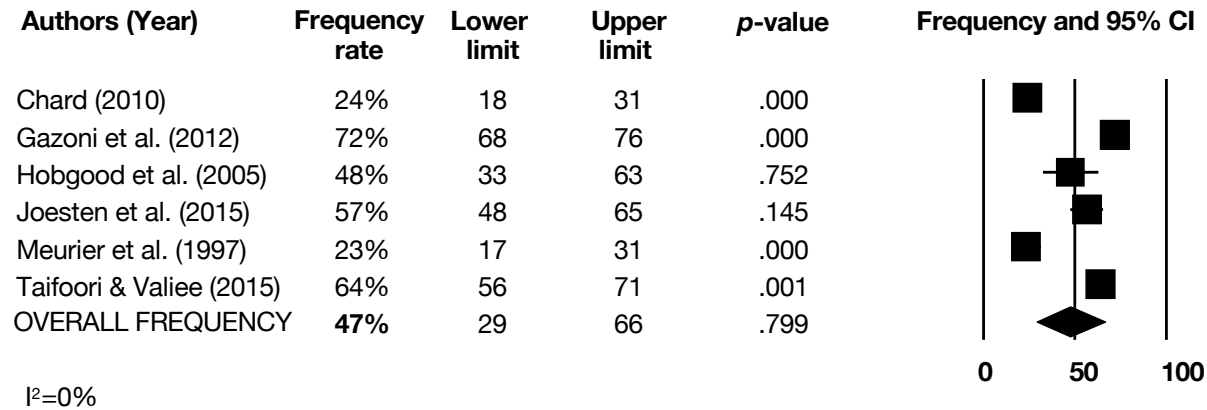
WORKING MORE SLOWLY AND CAREFULLY



Meta Analysis

## DISCLOSING THE ERROR TO/TALKING TO/SUPPORT FROM FRIENDS/PARTNER/FAMILY

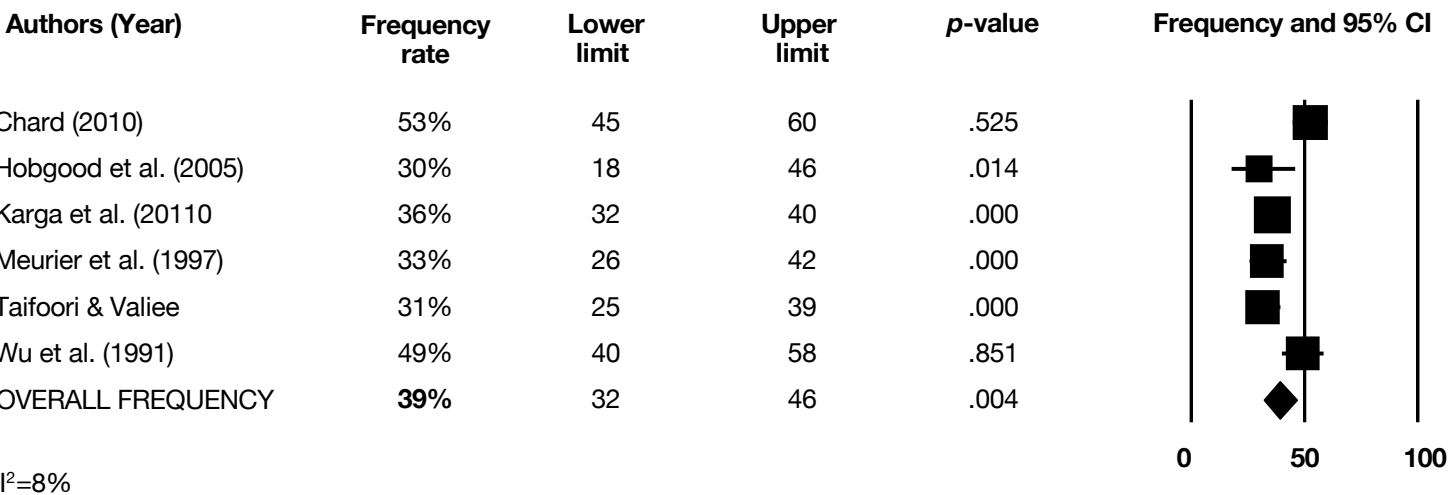
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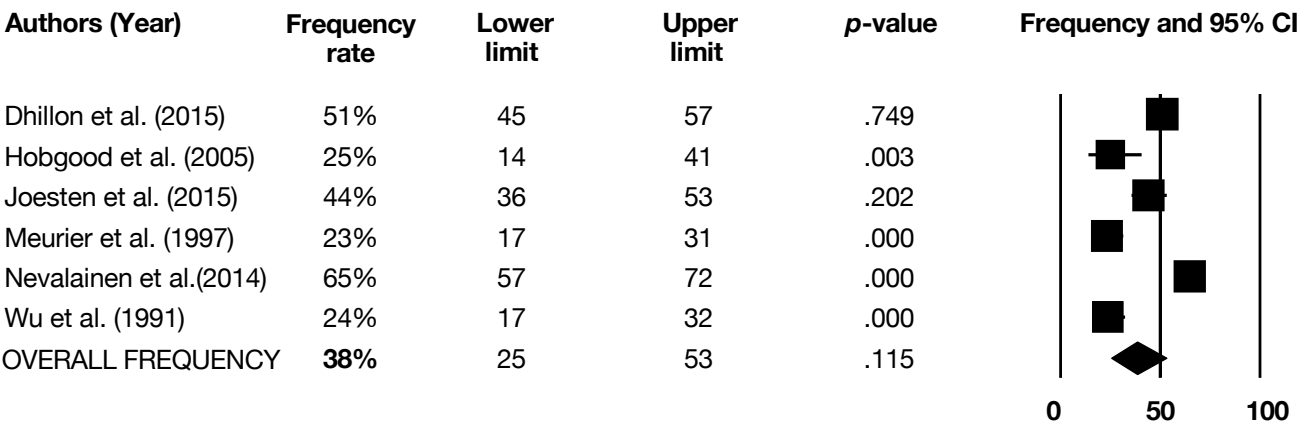
**Meta Analysis**

TRUSTING OTHERS LESS



Meta Analysis

# DISCLOSING THE ERROR AND TALKING TO THE PATIENT AND THE FAMILY

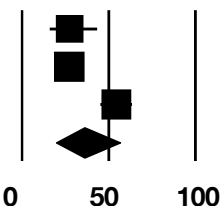


I<sup>2</sup>=4.3%

## Meta Analysis

READING MORE

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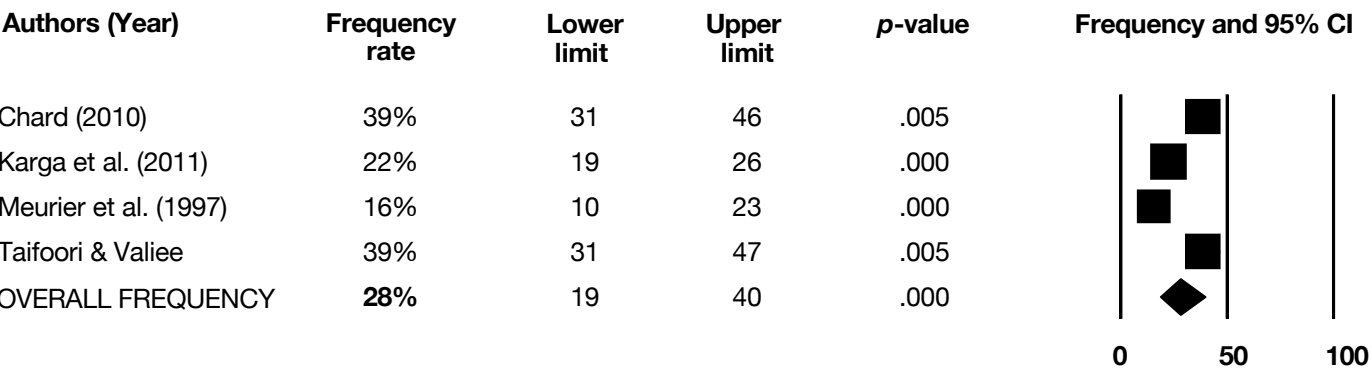
Authors (Year)	Frequency rate	Lower limit	Upper limit	p-value	Frequency and 95% CI
Hobgood et al. (2005)	28%	16	43	.006	
Karga et al. (2011)	27%	24	31	.000	
Wu et al. (1991)	54%	45	63	.350	
OVERALL FREQUENCY	36%	20	56	.175	
					0      50      100

I<sup>2</sup>=0%

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Meta Analysis

DISTANCING

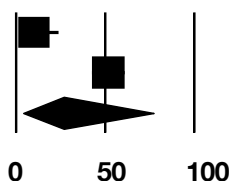


I<sup>2</sup>=18%

Meta Analysis

## CHANGING ONE'S DATA ORGANIZATION

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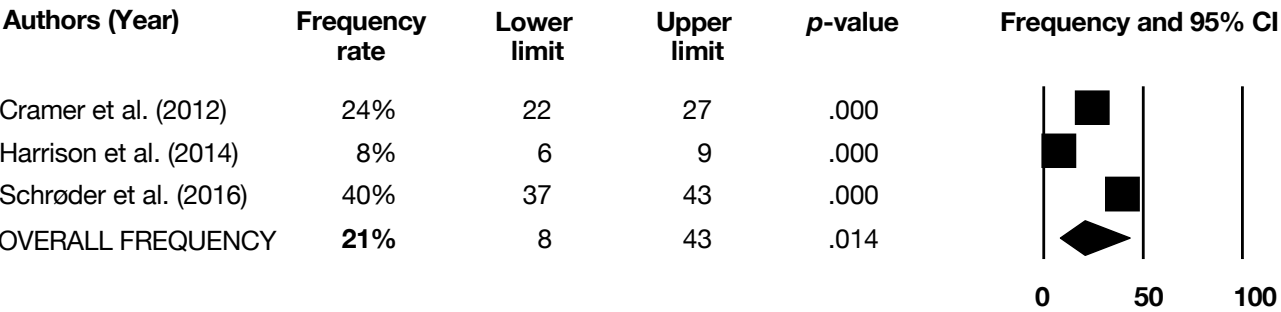
Authors (Year)	Frequency rate	Lower limit	Upper limit	p-value	Frequency and 95% CI
Hobgood et al. (2005)	10%	3	24	.000	
Wu et al. (1991)	52%	43	61	.708	
OVERALL FREQUENCY	<b>27%</b>	4	77	.372	

$I^2=0\%$

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### Meta Analysis

POSITIVE REAPPRAISAL



Meta Analysis

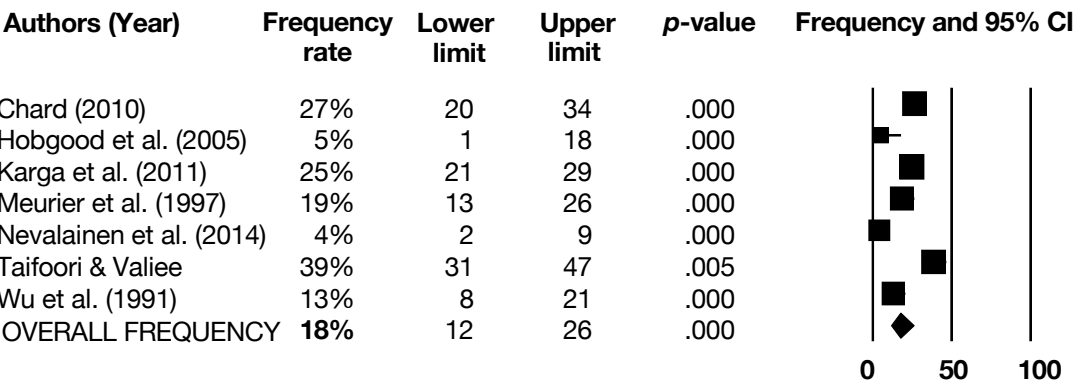
ORDERING MORE TESTS

Authors (Year)	Frequency rate	Lower limit	Upper limit	p-value	Frequency and 95% CI
Hobgood et al. (2005)	13%	5	27	.000	
Wu et al. (1991)	25%	18	34	.000	
OVERALL FREQUENCY	20%	10	36	.001	
					

I<sup>2</sup>=0%

Meta Analysis

TRYING TO HIDE THE ERROR/REFUSING TO TALK ABOUT IT

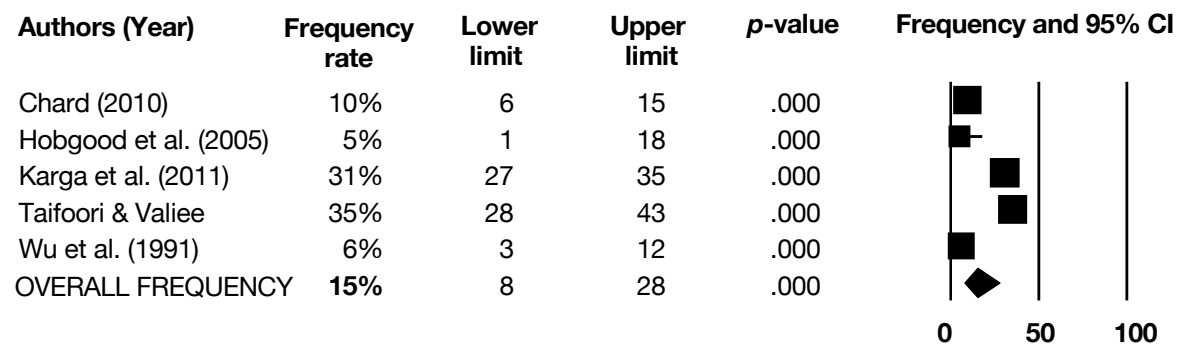


I<sup>2</sup>=48%

Meta Analysis

## AVOIDANCE OF PATIENTS, PROCEDURES, SITUATIONS

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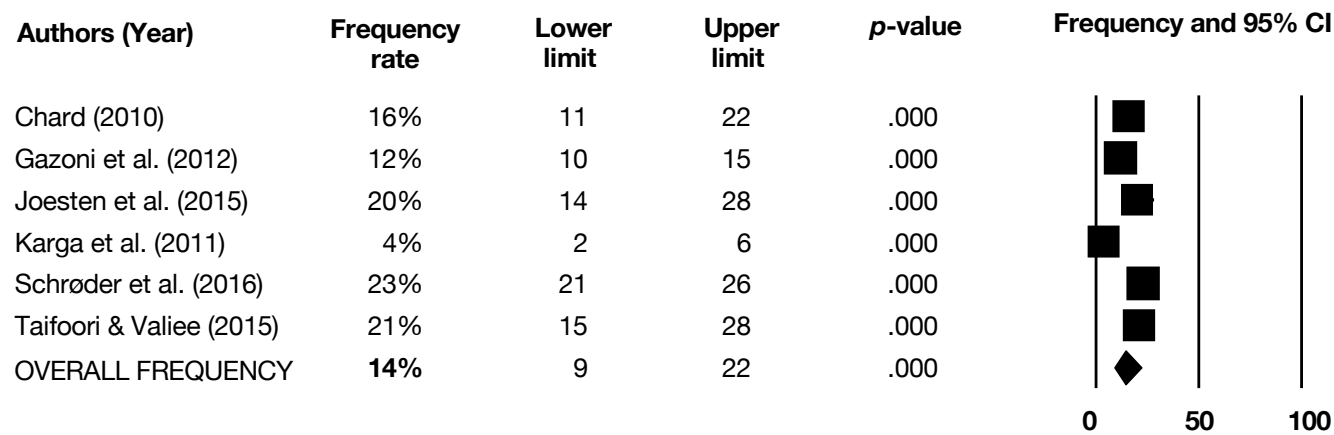


$I^2=36.2\%$

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### Meta Analysis

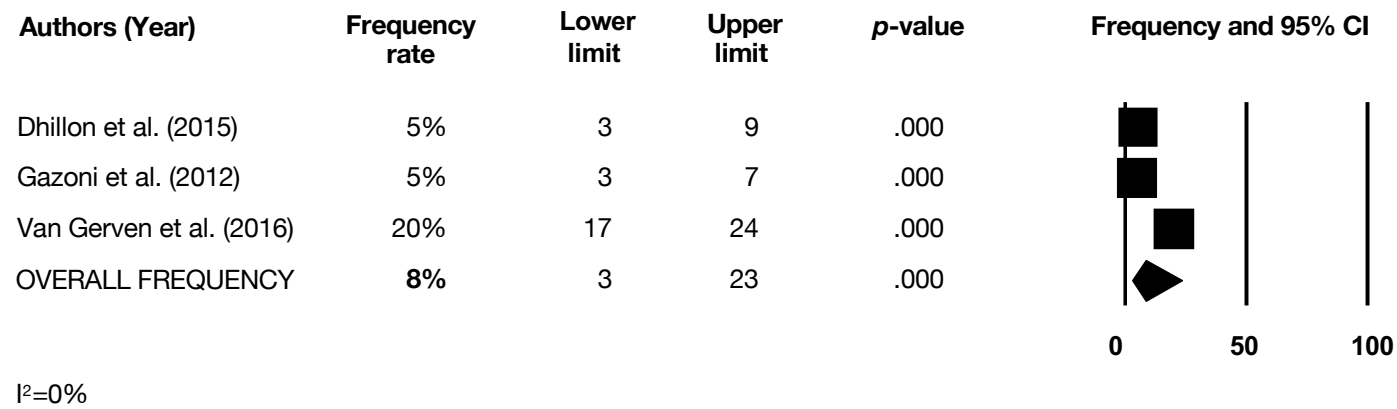
TURNOVER INTENTIONS



I<sup>2</sup>=21.6%

Meta Analysis

USE OF ALCOHOL/DRUGS/MEDICATION



Meta Analysis