

Evidence tables

Table 10: Evidence table „Supplementary graphic presentations in texts or tables versus numerical presentation only“

Certainty assessment						Summary of findings				
						No. of participants per group		Effect estimates		
Outcomes [No. of studies]	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Intervention	Control	Effects	Quality of evidence	Importance
Supplementary graphic presentations in texts or tables versus numerical presentation only										
Understanding / risk perception [n=6] Brewer (10) Hawley (7) Ruiz (8) Sprague (9) Tait (11) Tait (12)	RCT	serious (-1)	not serious	not serious	serious (-1)	N= 1776	N= 3537	In two studies effects for graphics (9, 11), in one study effect for tables (7), in three studies no effects (8, 10, 12).	low	critical
						+N= 2518 (allocation on intervention and control unclear)				
Knowledge [n=7] Brewer (10) Hawley (7) Lee (14) Tait (11) Tait (12) Tait (13) Zikmund-Fischer (15)	RCT	serious (-1)	not serious	not serious	serious (-1)	N= 1932	N= 3561	In three studies effects for graphics (7, 11, 12), in four studies no effects (10, 13-15).	low	critical
						+N= 3149 (allocation on intervention and control unclear)				

Comprehensibility [n=4] Hawley (7) Tait (11) Tait (12) Tait (13)	RCT	serious (-1)	not serious	not serious	not serious	N= 1696	N= 3189	In two studies effects (11) or rather tendency (7) for graphics, in one study effect for text (13), in one study no effect (12).	moderate	important but not critical
						+N= 2412 (allocation on intervention and control unclear)				
Readability [n=1] Brewer (10)	RCT	serious (-1)	not serious	not serious	not serious	N= 106 (total, allocation on intervention and control unclear)		In one study no effect (10).	moderate	important but not critical
Acceptance / attractiveness [n=1] Tait (13)	RCT	serious (-1)	not serious	not serious	serious (-1)	N= 150	N= 50	In one study effect for graphics (13).	low	limited importance
Trust / Credibility [n=2] Hawley (7) Tait (11)	RCT	serious (-1)	not serious	not serious	serious (-1)	N= 1546	N= 3139	In two studies effects for (11) or rather against (7) graphics.	low	limited importance
						+N= 2412 (allocation on intervention and control unclear)				

Table 11: Evidence table „Various types of graphics in comparison with each other“

Certainty assessment						Summary of findings				
						No. of participants per group		Effect estimates		
Outcomes [No. of studies]	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Intervention	Control	Effects	Quality of evidence	Importance
Various types of graphics in comparison with each other (i.e. pie or bar charts, pictograms,...)										
Understanding / risk perception [n=2] Ghosh (16) Hawley (7)	RCT	serious (-1)	not serious	not serious	not serious	N= 2562 (total, allocation on intervention and control unclear)	In one study effect for pictograms vs. other graphics (7). In two studies no effects for bar charts vs. pictograms (7, 16).	moderate	critical	
Knowledge (verbatim and gist knowledge) [n=2] Hawley (7) Tait (13)	RCT	serious (-1)	not serious	not serious	not serious	N= 2612 (total, allocation on intervention and control unclear)	In one study effect for pie charts vs. other graphics and effect for pictograms vs. other graphics (without pie charts) (7). In one study no effect (pie charts, bar charts, pictograms) (13).	moderate	critical	
Comprehensibility / readability [n=2] Feldman-Stewart (17) Hawley (7)	RCT	very serious (-2)	not serious	not serious	not serious	N= 2628 (total, allocation on intervention and control unclear)	In one study effect for bar charts and sorted pictograms vs. pie charts (17). In one study a tendency for pictograms (7).	low	important but not critical	
Acceptance / attractiveness [2] Ghosh (16) Tait (13)	RCT	serious (-1)	Keine Inkonsistenz	Keine Indirektheit	Schwerwiegende Impräzision (-1)	N= 350 (total, allocation on intervention and control unclear)	In two studies a tendency for pictograms and bar charts (13, 16).	low	limited importance	

Table 12: Evidence table „Pictograms sorted vs. unsorted“

Certainty assessment						Summary of findings				
						No. of participants per group		Effect estimates		
Outcomes [No. of studies]	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Intervention	Control	Effects	Quality of evidence	Importance
Pictograms sorted vs. unsorted										
Understanding / risk perception [n=1] Kasper (4)	RCT	serious (-1)	not serious	not serious	not serious	N= 111 (total, allocation on intervention and control unclear)		In one study no clear effect: effect for sorted pictograms to present side effects, no effect to present benefits (4).	moderate	critical
Knowledge [n=2] Wright (20) Zikmund-Fischer (18)	RCT	serious (-1)	not serious	not serious	not serious	N= 6342 (total, allocation on intervention and control unclear)		In one study effect for sorted pictograms, larger effect for <i>high numeracy</i> (18). In one study no effect (20).	moderate	critical
Comprehensibility / readability [n=2] Feldmann-Stewart (17) Wright (20)	RCT, partial within-subject design	very serious (-2)	not serious	not serious	not serious	N= 356 (total, allocation on intervention and control unclear)		In one study a tendency for sorted pictograms (17), in one study no effect (20).	low	important but not critical

Acceptance / attractiveness [n=3] Kasper (4) Schapira (19) Zikmund-Fischer (18)	RCT, partial within-subject design	serious (-1)	not serious	not serious	not serious	N= 6567 (total, allocation on intervention and control unclear)	In three studies effects for sorted pictograms (4, 18, 19).	moderate	limited importance
Trust / credibility [n=1] Schapira (19)	within-subject design	very serious (-2)	not serious	not serious	not serious	N= 254 (total, allocation on intervention and control unclear)	In one study effect for unsorted pictograms (19).	low	limited importance

Table 13: Evidence table „Pictograms animated vs. static“

Certainty assessment						Summary of findings				
						No. of participants per group		Effect estimates		
Outcomes [No. of studies]	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Intervention	Control	Effects	Quality of evidence	Importance
Pictograms animated vs. static										
Understanding / risk perception [n=1] Ancker (21)	online survey with control group	very serious (-2)	not serious	not serious	not serious	N= 165 (total, allocation on intervention and control unclear)		In one study no effect (21).	low	critical
Knowledge [n=2] Zikmund-Fischer (22) Zikmund-Fischer (18)	RCT	serious (-1)	not serious	not serious	not serious	N= 9556 (total, allocation on intervention and control unclear)		In one study no clear effect (22). In one study effect for single animations only, but not homogeneous for different level of numeracy (18).	moderate	critical
Comprehensibility / readability [n=2] Ancker (21) Zikmund-Fischer (22)	RCT and online survey with control group	serious (-1)	not serious	not serious	not serious	N= 3519 (total, allocation on intervention and control unclear)		In one study effect for static pictograms (22), in one study no effect (21).	moderate	important but not critical

Acceptance / attractiveness [n=1] Zikmund-Fischer (18)	RCT	serious (-1)	not serious	not serious	not serious	N= 6202 (total, allocation on intervention and control unclear)	In one study effect for static pictograms, for few animations no effect (18).	moderate	limited importance
Trust / credibility [n=1] Ancker (21)	online survey with control group	very serious (-2)	not serious	not serious	not serious	N= 165 (total, allocation on intervention and control unclear)	In one study effect for animated pictograms (21).	low	limited importance

Table 14: Evidence table „Various types of icons in comparison with each other“

Certainty assessment						Summary of findings				
						No. of participants per group		Effect estimates		
Outcomes [No. of studies]	Study design	Risk of bias	Inconsis- tency	Indirect- ness	Impreci- sion	Interven- tion	Control	Effects	Quality of evidence	Importance
Various types of icons in comparison with each other										
Geometric icons with each other										
Anthropomorphic vs. geometric icons										
Understanding / risk perception [n=4] Gaissmaier (24) McCaffery (26) Price (25) Zikmund-Fischer (23)	RCT, partial within- sub- ject design	very serious (-2)	not serious	not serious	not serious	N= 1976 (total, allocation on intervention and control unclear)		In one study effect for figures and photos vs. blocks (23). In three studies no effects (figures vs. blocks; blocks vs. ovals; shaded vs. not shaded) (24- 26).	low	critical
Knowledge [n=2] Gaissmaier (24) McCaffery (26)	RCT, partial within- sub- ject design	very serious (-2)	not serious	not serious	not serious	N= 400 (total, allocation on intervention and control unclear)		In two studies no effects (figures vs. geometric; blocks vs. ovals) (24, 26).	low	critical

Comprehensibility / readability [n=3] Gaissmaier (24) McCaffery (26) Price (25)	RCT, partial within-subject design	very serious (-2)	not serious	not serious	not serious	N= 476 (total, allocation on intervention and control unclear)	In three studies no effects (figures vs. geometric; blocks vs. ovals; shaded vs. not shaded) (24-26).	low	important but not critical
Acceptance / attractiveness [n=5] Gaissmaier (24) McCaffery (26) Price (25) Schapira (19) Zikmund-Fischer (23)	RCT, partial within-subject design	very serious (-2)	not serious	not serious	not serious	N= 2232 (total, allocation on intervention and control unclear)	In three studies effects for human figures / figurative representation / figures and photos vs. geometric representations (19, 23, 24). In one study effect for shaded vs. not shaded (25). In one study no effect (blocks vs. ovals) (26).	low	limited importance
Trust / credibility [n=1] Schapira (19)	RCT, partial within-subject design	Sehr schwerwiegendes Risiko für Bias (-2)	not serious	not serious	not serious	N= 254 (total, allocation on intervention and control unclear)	In one study no effect (figures vs. geometric) (19).	low	limited importance

Table 15: Evidence table „Simple versus combined risk presentation in graphics”

Certainty assessment						Summary of findings				
						No. of participants per group		Effect estimates		
Outcomes [No. of studies]	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Intervention	Control	Effects	Quality of evidence	Importance
Simple versus combined risk presentation in graphics										
Understanding / risk perception [n=3] Price (25) Zikmund-Fischer (27) Zikmund-Fischer (28)	RCT, partial within-subject design	serious (-1)	not serious	not serious	not serious	N= 2805 (total, allocation on intervention and control unclear)		In one study effect for single presentations (28). In one study a tendency for simple presentation (2 vs. 4 options, bar charts and pictograms) (27). In one study no effect (25).	moderate	critical
Knowledge [n=1] Zikmund-Fischer (15)	RCT	serious (-1)	not serious	not serious	not serious	N= 663 (total, allocation on intervention and control unclear)		In one study no effect (15).	moderate	critical

Comprehensibility / readability [n=3] Price (25) Zikmund-Fischer (28) Zikmund-Fischer (27)	RCT, partial within-subject design	serious (-1)	not serious	not serious	not serious	N= 2805 (total, allocation on intervention and control unclear)	In one study effect on comprehensibility for combined presentations, no effect on readability (25). In one study a tendency for simple presentations (2 vs. 4 options, bar charts and pictograms), no tests on statistical significance (27). In one study no effect (28).	moderate	important but not critical
Acceptance / attractiveness [n=3] Price (25) Zikmund-Fischer (28) Zikmund-Fischer (27)	RCT, partial within-subject design	serious (-1)	not serious	not serious	serious (-1)	N= 2805 (total, allocation on intervention and control unclear)	In one study effect for combined graphics (25). In one study a questionable effect for single presentations (28). In one study no effect (27).	low	limited importance

References

1. Ancker JS, Senathirajah Y, Kukafka R, Starren JB. Design features of graphs in health risk communication: a systematic review. *J Am Med Inform Assoc.* 2006;13(6):608-18. Epub 2006/08/25.
2. Bunge M, Muhlhauser I, Steckelberg A. What constitutes evidence-based patient information? Overview of discussed criteria. [References]. *Patient Education and Counseling* Vol78(3), Mar 2010, pp 316-328. 2010.
3. Heesen C, Köpke S, Kasper J. Immuntherapien der Multiplen Sklerose. 2008 [cited 01.12.2013]; Available from: <http://www.gesundheit.uni-hamburg.de/upload/Immuntherapien%20der%20MS.pdf>.
4. Kasper J, Heesen C, Köpke S, Muhlhauser I, Lenz M. Why not?-Communicating stochastic information by use of unsorted frequency pictograms-A randomised controlled trial. [References]. *GMS Psycho-Social-Medicine* Vol8 Nov 2011, ArtID Doc08. 2011.
5. Steckelberg A, Muhlhauser I. Früherkennung Darmkrebs. 2011 [19.12.2013]; Available from: <http://www.gesundheit.uni-hamburg.de/upload/NeueDarmkrebsbroschuere2011.pdf>.
6. Kasper J, Roemer Avd, Pöttgen J, Rahn A, Backhus I, Bay Y, et al. A new graphical format to communicate treatment effects to patients—A web-based randomized controlled trial. *Health expectations: an international journal of public participation in health care and health policy.* 2016. Epub ahead of print.
7. Hawley ST, Zikmund-Fisher B, Ubel P, Jancovic A, Lucas T, Fagerlin A. The impact of the format of graphical presentation on health-related knowledge and treatment choices. *Patient education and counseling* [Internet]. 2008; (3):[448-55 pp.]. Available from: <http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/282/CN-00665282/frame.html>.
8. Ruiz JG, Andrade AD, Garcia-Retamero R, Anam R, Rodriguez R, Sharit J. Communicating global cardiovascular risk: are icon arrays better than numerical estimates in improving understanding, recall and perception of risk? *Patient Educ Couns.* 2013;93(3):394-402. Epub 2013/08/07.
9. Sprague D, LaVallie DL, Wolf FM, Jacobsen C, Sayson K, Buchwald D. Influence of graphic format on comprehension of risk information among American Indians. [References]. *Medical Decision Making* Vol31(3), May-Jun 2011, pp 437-443. 2011.

10. Brewer NT, Gilkey MB, Lillie SE, Hesse BW, Sheridan SL. Tables or bar graphs? Presenting test results in electronic medical records. *Med Decis Making*. 2012;32(4):545-53. Epub 2012/04/05.
11. Tait AR, Voepel-Lewis T, Zikmund-Fisher BJ, Fagerlin A. The effect of format on parents' understanding of the risks and benefits of clinical research: a comparison between text, tables, and graphics. *Journal of health communication* [Internet]. 2010; (5):[487-501 pp.]. Available from: <http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/561/CN-00749561/frame.html>.
12. Tait AR, Voepel-Lewis T, Zikmund-Fisher BJ, Fagerlin A. Presenting research risks and benefits to parents: does format matter? *Anesthesia and analgesia* [Internet]. 2010; (3):[718-23 pp.]. Available from: <http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/178/CN-00760178/frame.html>.
13. Tait AR, Voepel-Lewis T, Brennan-Martinez C, McGonegal M, Levine R. Using animated computer-generated text and graphics to depict the risks and benefits of medical treatment. *Am J Med*. 2012;125(11):1103-10. Epub 2012/09/04.
14. Lee DH, Mehta MD. Evaluation of a visual risk communication tool: effects on knowledge and perception of blood transfusion risk. *Transfusion*. 2003;43(6):779-87. Epub 2003/05/22.
15. Zikmund-Fisher BJ, Ubel PA, Smith DM, Derry HA, McClure JB, Stark A, et al. Communicating side effect risks in a tamoxifen prophylaxis decision aid: the debiasing influence of pictographs. *Patient Educ Couns*. 2008;73(2):209-14. Epub 2008/07/08.
16. Ghosh K, Crawford BJ, Pruthi S, Williams CI, Neal L, Sandhu NP, et al. Frequency format diagram and probability chart for breast cancer risk communication: a prospective, randomized trial. *BMC women's health* [Internet]. 2008:[18 p.]. Available from: <http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/437/CN-00665437/frame.html>.
17. Feldman-Stewart D, Brundage MD, Zotov V. Further insight into the perception of quantitative information: judgments of gist in treatment decisions. *Med Decis Making*. 2007;27(1):34-43. Epub 2007/01/24.
18. Zikmund-Fisher BJ, Witteman HO, Fuhrel-Forbis A, Exe NL, Kahn VC, Dickson M. Animated graphics for comparing two risks: a cautionary tale. *Journal of medical Internet research*. 2012;14(4):e106. Epub 2012/07/27.

19. Schapira MM, Nattinger AB, McAuliffe TL. The influence of graphic format on breast cancer risk communication. *J Health Commun.* 2006;11(6):569-82. Epub 2006/09/05.
20. Wright P. What if...? Designing tools to help the public make difficult decisions. [References]. *Information Design Journal* Vol17(3), 2009, pp 202-210. 2009.
21. Ancker JS, Weber EU, Kukafka R. Effects of game-like interactive graphics on risk perceptions and decisions. *Medical decision making : an international journal of the Society for Medical Decision Making.* 2011;31(1):130-42. Epub 2010/04/16.
22. Zikmund-Fisher BJ, Dickson M, Witteman HO. Cool but counterproductive: interactive, Web-based risk communications can backfire. *Journal of medical Internet research.* 2011;13(3):e60. Epub 2011/08/27.
23. Zikmund-Fisher BJ, Witteman HO, Dickson M, Fuhrel-Forbis A, Kahn VC, Exe NL, et al. Blocks, ovals, or people? Icon type affects risk perceptions and recall of pictographs. [References]. *Medical Decision Making* Vol34(4), May 2014, pp 443-453. 2014.
24. Gaissmaier W, Wegwarth O, Skopec D, Muller AS, Broschinski S, Politi MC. Numbers can be worth a thousand pictures: individual differences in understanding graphical and numerical representations of health-related information. *Health Psychol.* 2012;31(3):286-96. Epub 2011/08/17.
25. Price M, Cameron R, Butow P. Communicating risk information: the influence of graphical display format on quantitative information perception-Accuracy, comprehension and preferences. *Patient education and counseling.* 2007;69(1-3):121-8. Epub 2007/10/02.
26. McCaffery KJ, Dixon A, Hayen A, Jansen J, Smith S, Simpson JM. The influence of graphic display format on the interpretations of quantitative risk information among adults with lower education and literacy: A randomized experimental study. [References]. *Medical Decision Making* Vol32(4), Jul 2012, pp 532-544. 2012.
27. Zikmund-Fisher BJ, Fagerlin A, Ubel PA. Improving understanding of adjuvant therapy options by using simpler risk graphics. *Cancer.* 2008;113(12):3382-90. Epub 2008/11/18.
28. Zikmund-Fisher BJ, Fagerlin A, Ubel PA. A demonstration of "less can be more" in risk graphics. [References]. *Medical Decision Making* Vol30(6), Nov-Dec 2010, pp 661-671. 2010.