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| Amadi-Obi A, Gilligan P, Owens N, Donnell C (2014) | Systematic review 1970 – 2014 n=39 explorative character | • a majority of the studies were on stroke management  
• overall telemedicine had a positive impact on emergency medical care  
• it improved the pre-hospital diagnosis of stroke and myocardial infarction and enhanced the supervision of delivery of tissue thromboplasminogen activator in acute ischaemic stroke  
• telemedicine presents an opportunity to enhance patient management  
• there are as yet few definitive studies that have demonstrated whether it had an effect on clinical outcome |
• high prevalence of collaborative writing applications use (ie, more than 50%) is reported in 58% of surveys conducted with health care professionals and students  
• only one longitudinal study showing that collaborative writing applications use is increasing in health care, contribution rates remain low and the quality of information contained in different collaborative writing applications needs improvement  
• 48 barriers and 91 facilitators in 4 major themes (factors related to the collaborative writing application, users’ knowledge and attitude towards collaborative writing applications, human environment, and organizational environment)  
• 57 positive and 23 negative effects (classified into processes and outcomes) |
| Black AD, Car J, Pagliari C, Anandan C, Cresswell K, Bobkun T, McKinstry B, Procter R, Majeed A, Sheikh A (2011) | Systematic review of systematic reviews 1995 – 2010 n=53 explorative character | • three categories of eHealth technologies has been identified: (1) storing, managing, and transmission of data; (2) clinical decision support; and (3) facilitating care from a distance  
• large gap between the postulated and empirically demonstrated benefits of eHealth technologies  
• In addition, there is a lack of robust research on the risks of implementing these technologies and their cost-effectiveness has yet to be demonstrated, despite being frequently promoted by policymakers and “ techno-enthusiasts” as if this was a given |
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<tr>
<td>Bolton AJ, Dorstyn DS (2015)</td>
<td>Systematic review</td>
<td>• short-term treatment gains were reported for internet and video-based interventions (significant medium to large improvements in cognitive and behavioural symptoms of depression, generalised anxiety and posttraumatic stress)</td>
</tr>
<tr>
<td>Telepsychology for Posttraumatic Stress Disorder: A systematic review</td>
<td>1970 – 2014</td>
<td>• equivalence of telepsychology and face-to-face psychotherapy could not be determined</td>
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<tr>
<td>To evaluate the effectiveness of psychological services provided remotely, telepsychology, for management of Posttraumatic Stress Disorder</td>
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<tr>
<td>Capurro D, Ganzinger M, Perez-LJ, Knaup P (2014)</td>
<td>Systematic review</td>
<td>• limited evidence around the effectiveness of eHealth interventions for palliative care patients, caregivers, and health care professionals (no randomized controlled trial, observational, non-controlled studies, and a few quasi-experimental studies)</td>
</tr>
<tr>
<td>Effectiveness of eHealth Interventions and Information Needs in Palliative Care: A Systematic Literature Review</td>
<td>no restriction in year of publication</td>
<td>• great heterogeneity in the types of interventions and outcome assessments; some studies reported some improvement on quality of care, documentation effort, cost, and communications</td>
</tr>
<tr>
<td>J Med Internet Res. 2014 Mar; 16(3): e72</td>
<td>n=17 explorative character</td>
<td>• the most frequently reported information need concerned pain management</td>
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<td>To analyse the effectiveness of eHealth interventions in palliative care and the information needs of people involved in the palliative care process</td>
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<tr>
<td>Charova E, Dorstyn D, Tully P, Mittag O (2015)</td>
<td>Systematic review</td>
<td>• study designs most commonly performed with diabetes and multiple sclerosis</td>
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<td>Web-based interventions for comorbid depression and chronic illness: a systematic review</td>
<td>1990 – 2014</td>
<td>• most studies were statistically underpowered although internal validity was demonstrated</td>
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<td>Journal of Telemedicine and Telecare, 2015, 21(4): 189-201</td>
<td>n=11 explorative and confirmatory character</td>
<td>• significant short-term improvements in depression severity, in addition to quality of life, problem-solving skills, functional ability, anxiety and pain related cognitions</td>
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<tr>
<td>To examine Web-based intervention offer potential benefits for managing and treating depression in the context of chronic physical illness</td>
<td></td>
<td>• long-term outcomes could not be determined based on limited data</td>
</tr>
<tr>
<td>Cresswell K, Majeed A, Bates DW, Sheikh A (2012)</td>
<td>Interpretative review</td>
<td>• lack of investigating potential risks resulting not only from technical challenges (such as data inaccuracies) but also from disruption of clinical workflows</td>
</tr>
<tr>
<td>Computerised decision support systems for healthcare professionals</td>
<td>1997 – 2010</td>
<td>• computerised decision support systems can result in improvements in practitioner performance in the promotion of preventive care and guideline adherence, particularly if specific information is available in real time and systems are effectively integrated into clinical workflows</td>
</tr>
<tr>
<td>Inform Prim Care 2012;20(2): 115-28</td>
<td>n=41 explorative character</td>
<td>• the evidence regarding impact on patient outcomes was less clear-cut with reviews finding either no, inconsistent or modest benefits</td>
</tr>
<tr>
<td>Empirical evidence on computerised decision supporting systems and their impact on the quality and safety of healthcare delivery (in the context of ehealth)</td>
<td></td>
<td>• a need for system development, procurement and implementation to be characterised by a user “pull”</td>
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| **Cugelman B, Thelwall M, Dawes P (2011)** | Meta-analysis 1999 – 2008 n=31 explorative and confirmatory character | • overall impact of online interventions across all studies was small but statistically significant  
• the largest impact with a moderate level of efficacy was exerted from online interventions when compared with waitlists and placebos, followed by comparison with lower-tech online interventions  
• no significant difference was found when compared with sophisticated print interventions, though online interventions offer a small effect with the advantage of lower costs and larger reach  
• time proved to be a critical factor, with shorter interventions generally achieving larger impacts and greater adherence  
• goal orientated psychological designs deploying influence components aimed at showing users the consequences of their behaviour, assisting them in reaching goals, and providing normative pressure  
• given the high reach and low cost of online technologies, the stage may be set for increased public health campaigns that blend interpersonal online systems with mass-media outreach |
| **Davies EB, Morriss R, Glazebrook C (2014)** | Systematic review and meta-analysis no restriction in year of publication n=17 explorative and confirmatory character | • a total of 1795 participants were randomized and 1480 analysed  
• Web-based and computer-delivered interventions can be effective in improving students’ depression, anxiety, and stress outcomes when compared to inactive controls  
• some caution is needed when compared to other trial arms and methodological issues were noticeable  
• interventions need to be trialed on more heterogeneous student samples and would benefit from user evaluation |
| **Elbert N J, van Os-Medendorp H, van Renselaar W, Ekeland AG, Hakkaart-van Roijen L, Raat H, Nijsten TEC, Pasmans S (2014)** | Systematic review of systematic reviews and meta-analyses 2009 – 2012 n=31 explorative and confirmatory character | • the number of reviews and meta-analyses on eHealth interventions in patients with somatic diseases has increased considerably in recent years  
• most articles show eHealth is effective/cost-effective or at least suggest evidence is promising, which is consistent with previous finding  
• although many researchers advocate larger, well-designed, controlled studies, attention should be given to the development and evaluation of strategies to implement effective/cost-effective eHealth initiatives in daily practice, rather than to further strengthen current evidence |
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<td><strong>Ellis D W, Srigley J (2015)</strong></td>
<td>Systematic review search method and sample not clear n=8 explorative character</td>
<td>• good evidence in improving quality on patient clinical care (reporting quality parameters: timeliness, accuracy, completeness, conformance with current agreed standards, consistency and clarity in communication) • for large, population-wide use, there are two additional key considerations if the report quality is to be “fit for purpose” (role of cancer registries and data repositories is changing from historical review to real-time dynamic analysis and feedback; population-wide studies, particularly for benchmarking, require a single agreed international standard to ensure interoperability and comparability) • few published studies available indicate clinician satisfaction with completeness and readability of both structured and synoptic reports • Implementation issues (adoption and redemption factors: the need for a local pathologist leader or champion, the use of incentives such as co-payments, jurisdictional mandation and pathologist perception of the impact of SR upon their efficiency and workflow • further challenges in assimilating large amounts of complex information (already, some datasets are too large for the traditional synoptic format)</td>
</tr>
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<td><strong>Gee PM, Greenwood DA, Paterniti DA, Ward D, Soederberg-Miller LM (2015)</strong></td>
<td>Systematic review 2000 – 2014 n=95 explorative character</td>
<td>• clear definitions for eHealth, telehealth, and PHRs are needed to move forward in formulating appropriate research questions • a gap in the literature exists in the efficacy of using online health communities for self-management support (while social support itself is shown to improve engagement and health outcomes with adults who have chronic illness, little is known about whether social support offered in online health communities has the same effect) • eHealth interventions that included the complete feedback loop improved outcomes • health education and technology experts are needed to develop a curriculum to train patients/consumers to use the eHealth tools that have been shown to improve health outcomes for the chronically ill person • health care providers will need training on how to implement eHealth interventions and how to educate their chronically ill patients to use these tools</td>
</tr>
<tr>
<td><strong>Househ M (2014)</strong></td>
<td>Systematic review of systematic reviews 1990 – 2013 n=13 explorative character</td>
<td>• low to moderate research evidence exists on the benefits of short messaging service interventions for appointment reminders, promoting health in developing countries and preventive healthcare • a few studies of high quality, and most of the studies were rated from low to moderate quality or had no rating at all</td>
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| Knowles SR, Mikocka-Walus A (2014)          | Systematic review        | • overall psychological eHealth intervention were associated with significant reduction in bowel symptoms and improvement in quality of life that tended to continue up to 12 month follow up  
• eHealth disease management was shown to generally improve quality of life, adherence, knowledge about the disease, and reduce healthcare costs in inflammatory bowel disease  
• the studies were associated with various methodological problems |
| Utilization and efficacy of internet-based eHealth technology in gastroenterology: a systematic review  
To evaluate the research conducted within gastroenterology with utilizes internet-based eHealth technology to promote physical and psychological well-being | Systematic review  
no restriction in year of publication  
n=17  
extplorative character |                                                                                                                                                  |
1990 – 2012  
n=19  
extplorative character | • significant, positive effects on patient empowerment were reported by 4 studies and 2 studies reported positive effects on physical activity  
• remaining studies yielded mixed results or no significant group differences in these outcomes  
• content, duration, and frequency of interventions varied considerably across studies  
• commonly used elements included education, self-monitoring, feedback/tailored information, self-management training, personal exercise program, and communication (e.g., chat, email) with either health care providers or patients  
• limited information on barriers, facilitators, and users’ experiences  
• methodological quality varied, with 13 studies being of moderate quality  
• reported Web-based intervention elements appeared to be highly relevant to address the specific needs of cancer survivors |
| A Systematic Review of Web-Based Interventions for Patient Empowerment and Physical Activity in Chronic Diseases: Relevance for Cancer Survivors  
J Med Internet Res. 2013 Feb; 15(2): e37  
To explore interactive Web-based interventions aimed at increasing patient empowerment and physical activity for various chronic conditions, and their possible relevance for cancer survivors |                                                                                       |                                                                                                                                                  |
| Li J, Talaei-Khoei A, Seale H, Ray P, MacIntyre CR (2013) | Systematic review        | • 40 factors were identified and grouped into 7 clusters: (1) health care provider characteristics, (2) medical practice characteristics, (3) voluntariness of use, (4) performance expectancy, (5) effort expectancy, (6) social influence, and (7) facilitating or inhibiting conditions  
• The grouping results demonstrated that the Unified Theory of Acceptance and Use of Technology model is useful for organizing the literature but has its limitations |
| Health Care Provider Adoption of eHealth: Systematic Literature Review  
To identify and synthesize influential factors to health care providers’ acceptance of various eHealth systems | Systematic review  
no restriction in year of publication  
n=93  
extplorative character |                                                                                                                                                  |
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| Linn A J, Vervloet M, van Dijk L, Smit EG, PhD, van Weert JCM (2011) | Systematic review | • all included Internet interventions clearly used moderately or highly sophisticated computer-tailored methods  
• data synthesis revealed that there is evidence for the effectiveness of Internet interventions in improving medication adherence  
• most studies used self-reported measurements to assess adherence, which is generally perceived as a low-quality measurement  
• in addition, we did not find a clear relationship between the quality of the studies or the level of sophistication of message tailoring and the effectiveness of the intervention  
• great difference in study designs and the way of measuring adherence, which makes results difficult to compare  
• large variation in the measured interval between baseline and follow-up measurements |
| Morrison D, Wyke S, Agur K, Cameron EJ, Docking RI, MacKenzie AM, Raghuvir V, Thomson NC, Mair FS, (2014) | Systematic review | • Interventions were heterogeneous: duration of interventions ranging from single use, to 24-hour access for 12 months, and incorporating varying degrees of health professional involvement  
• participants were inadequately described  
• no qualitative systematic reviews were included, meta-analysis was not attempted due to heterogeneity and inadequate information provision within reviews  
• no evidence of harm from digital interventions  
• digital self-management interventions show promise, with evidence of beneficial effects on some outcomes (knowledge, activity limitation, markers of self-care, quality of life, medication use, effects on symptoms and school absences)  
• no evidence of overall benefits on lung function or health service use  
• no specific data on economic analyses were provided, intervention descriptions were generally brief making it impossible to identify which specific “ingredients” of interventions contribute most to improving outcomes |
| Paré G, Jaana M, Sicotte C (2007) | Systematic review | • magnitude and significance of the telemonitoring effects on patients’ conditions (e.g., early detection of symptoms, decrease in blood pressure, adequate medication, reduced mortality) still remain inconclusive for all four chronic illnesses  
• economic viability of telemonitoring was observed in very few studies and, in most cases, no in-depth cost-minimization analyses were performed  
• home telemonitoring of chronic diseases seems to be a promising patient management approach that produces accurate and reliable data, empowers patients, influences their attitudes and behaviors, and potentially improves their medical conditions  
• future studies need to build evidence related to its clinical effects, cost effectiveness, impacts on services utilization, and acceptance by health care providers |

To investigate which tailored Internet interventions are effective in improving medication adherence  

No restriction in year of publication  
n=13  
explanatory character  

Digital Asthma Self-Management Interventions: A Systematic Review  
J Med Internet Res. 2014 Feb; 16(2): e51  

To summarize current knowledge, evidenced through existing systematic reviews, of the effectiveness and implementation of digital self-management support for adults and children with asthma and to examine what features help or hinder the use of these programs  

Interventions were heterogeneous: duration of interventions ranging from single use, to 24-hour access for 12 months, and incorporating varying degrees of health professional involvement  

Participants were inadequately described  

No qualitative systematic reviews were included, meta-analysis was not attempted due to heterogeneity and inadequate information provision within reviews  

No evidence of harm from digital interventions  

Digital self-management interventions show promise, with evidence of beneficial effects on some outcomes (knowledge, activity limitation, markers of self-care, quality of life, medication use, effects on symptoms and school absences)  

No evidence of overall benefits on lung function or health service use  

No specific data on economic analyses were provided, intervention descriptions were generally brief making it impossible to identify which specific “ingredients” of interventions contribute most to improving outcomes  

Systematic Review of Home Telemonitoring for Chronic Diseases: The Evidence Base  

To present nature and magnitude of outcomes associated with telemonitoring of four types of chronic illnesses: pulmonary conditions, diabetes, hypertension, and cardiovascular diseases  

Telemonitoring of chronic diseases seems to be a promising patient management approach that produces accurate and reliable data, empowers patients, influences their attitudes and behaviors, and potentially improves their medical conditions  

Future studies need to build evidence related to its clinical effects, cost effectiveness, impacts on services utilization, and acceptance by health care providers
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<tr>
<td>Raaijmakers LCH, Pouwels S, Berghuis KA, Nienhuijs SW (2015) Technology-based interventions in the treatment of overweight and obesity: A systematic review Appetite 2015, 95, 138e151</td>
<td>Systematic review no restriction in year of publication n=27 explorative character</td>
<td>• thirteen studies showed significant effects on weight loss compared to controls • most interventions used a web-based approach (42%) • interventions were screened for five technical key components: self-monitoring, counselor feedback and communication, group support, use of a structured program and use of an individually tailored program • all interventions that used a combination of all five or four components showed significant decreases in weight compared to controls • no significant results for quality of life were found • outcomes on program adherence were reported in six studies • no significant results were found between weight loss and program adherence • evidence is lacking about the optimal use of technology in weight loss interventions</td>
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<tr>
<td>Samoocha D, Bruinvels DJ, Elbers NA, Anema JR, van der Beek AJ (2010) Effectiveness of Web-based Interventions on Patient Empowerment: A Systematic Review and Meta-analysis J Med Internet Res. 2010; 12(2): e23</td>
<td>Systematic review and meta-analysis 1985 – 2009 n=19 explorative and confirmatory character</td>
<td>• in comparison with usual care or no care, Web-based interventions had a significant positive effect on empowerment measured with the Diabetes Empowerment Scale, on self-efficacy measured with disease-specific self-efficacy scales, and on mastery measured with the Pearlin Mastery Scale • no effects were found for self-efficacy measured with general self-efficacy scales or for self-esteem measured with the Rosenberg Self-Esteem Scale • no significant (beneficial or harmful) effects were found for mastery and self-esteem , when comparing Web-based interventions with face-to-face deliveries of the same interventions • because of the low quality of evidence we found, the results should be interpreted with caution • the clinical relevance of the findings can be questioned because the significant effects were, in general, small</td>
</tr>
<tr>
<td>Schnall R, Travers J, Rojas M, Carballo-Diéguez A (2014) eHealth Interventions for HIV Prevention in High-Risk Men Who Have Sex With Men: A Systematic Review J Med Internet Res. 2014 May; 16(5): e134</td>
<td>Systematic review 2000 – 2014 n=13 explorative character</td>
<td>• Interventions included Web-based education modules, text messaging (SMS, short message service), chat rooms, and social networking • methodological quality of articles ranged from 49.4-94.6% (wide variation in the interventions meant synthesis of the results using meta-analysis would not be appropriate) • evidence that eHealth for HIV prevention in high-risk MSM has the potential to be effective in the short term for reducing HIV risk behaviors and increasing testing rates • given that many of these studies were short term and had other limitations, but showed strong preliminary evidence of improving outcomes</td>
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• Findings were mixed but promising  
• only 7 of 20 reviews were of high methodological quality, and only 4 employed meta-analyses  
• few reviews linked intervention content to effectiveness |
| Watkins I, Bo Xie M (2014) | Systematic review 2003 – 2013 n=23 explorative character | • significant gap in the literature for eHealth literacy interventions evaluating health outcomes as the outcome of interest  
• lack of theory-based interventions  
• few studies applied high quality research design |
| Wildevuur SE, Simonse L (2015) | Scoping review 1989 – 2013 n=350 explorative character | • Persons with one of these chronic conditions used ICT primarily for self-measurement of the body, when interacting with health care providers, with the highest rates of use seen in chronic respiratory (63%, 46/73) and cardiovascular (53%, 47/89) diseases  
• 60 relevant studies (17.1%, 60/350) on person-centred shared management ICT, primarily using telemedicine systems as personalized ICT  
• the highest impact measured related to the increase in empowerment (15.4%, 54/350) health-related quality of life accounted for 8%  
• the highest impact connected to health professionals was an increase in clinical outcome (11.7%, 41/350)  
• the impacts on organization outcomes were decrease in hospitalization (12.3%, 43/350) and increase of cost efficiency (10.9%, 38/350)  
• ICT-person-centred care also yields organizational paybacks, leading to an increase in health care usage  
• few interventions could be regarded as “fully” addressing person-centred care |
eHealth in Deutschland
Anforderungen und Potenziale innovativer Versorgungsstrukturen
Fischer, F.; Krämer, A. (Hrsg.)
2016, XX, 470 S. 33 Abb., Hardcover