

Technology-Based Gratitude Interventions for Enhancing Mental Health and Well-Being in the Community

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ABSTRACT

In the contemporary society, technology has emerged as a significant tool for fostering emotional expression, particularly in conveying feelings of gratitude, love, and affection towards others and oneself. This review investigated the efficacy of technology-based gratitude interventions in promoting gratitude, enhancing mental health, and improving overall well-being among individuals within the community. Comprehensive search was conducted across various electronic databases, including PubMed, PsycINFO, Scopus, Google Scholar, Ingenta and other sources. Through a rigorous procedure eleven relevant studies were identified, each shedding light on the impact of technology-based gratitude interventions on psychological outcomes. The studies listed different technology-based gratitude interventions such as telehealth services, counseling and psychotherapy platforms, and web-based interventions like daily gratitude writeups on social media, blogging, and gratitude journaling apps. These interventions have proven to be effective in fostering positive psychological changes among individuals from different backgrounds and age groups, making them accessible and scalable mental health tools. Mental health professionals can integrate technology-based gratitude interventions into their practice, providing individuals with practical and engaging strategies. Moreover, the interventions exhibit promise in mitigating psychopathological behaviors, offering promising implications for addressing mental health challenges in the community.

Key-words: Social Media, Gratitude, Mental health, Community Well-being, Positive Psychology, Web-based Interventions

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INTRODUCTION

In today's modern world, technology has permeated every aspect of our lives, becoming an integral part of how we communicate, express emotions, and navigate daily challenges. The COVID-19 pandemic further accelerated the reliance on technology as children, young people, and adults turned to online platforms, social networking websites, and smartphones to stay connected, engage in online learning, and share information. While there are concerns about the potential negative impacts of technology on attitudes and well-being, an exciting and growing field known as positive computing is exploring how technology can be harnessed to support well-being and human potential.¹

Positive computing seeks to design and develop technologies that enrich personal experiences and promote positive affect and well-being.^{2,3} A pivotal concept within positive computing is positive technologies, which focuses on leveraging technology to enhance the quality of personal experiences.⁴ Notable examples of such positive technologies, EARTH of Well-being⁵ and Smiling is Fun,⁶ have been developed to promote positive emotions in users. Considering the current context, where technology's omnipresence is unavoidable, integrating positive psychological techniques, like gratitude, using technological advancements seems an apt and compelling choice to foster overall health and well-being. The notion of practicing gratitude has deep historical roots across diverse cultures and philosophical traditions.

Gratitude has long been considered a cherished virtue, both in Western philosophies and other ancient teachings, including Jewish, Christian, Muslim, Buddhist, and Hindu thought.^{7,8,9} Nowadays, innovative approaches are being explored to cultivate gratitude

through technology-enabled means. Social media platforms, gratitude apps, interactive games, and virtual groups provide avenues for users to engage in gratitude expressions, leading to potential health benefits. However, the mechanisms underlying how these digital interactions foster gratitude experiences warrant further investigation. This paper attempts to review studies in this area to understand how technology is being used to develop gratitude and thus improve mental health and wellbeing in the community. The findings will offer valuable guidance to mental health practitioners, policymakers, and individuals seeking to harness the positive potential of technology in enhancing gratitude and well-being within diverse communities. Furthermore, these insights may be particularly relevant in current time post COVID-19 pandemic, where technology can serve as a valuable resource in supporting emotional and mental health.

METHODOLOGY

The study aimed to provide insights into the potential implications of technology-based gratitude interventions in the community. By identifying their effectiveness in promoting gratitude and fostering mental well-being, as well as reducing psychopathological behaviors, the research will contribute to the growing field of positive computing and technology-driven interventions. This study involved a systematic review of existing literature on technology-based gratitude interventions. To collect relevant studies, a comprehensive search was conducted across various electronic databases, including PubMed, PsycINFO, Scopus, Google Scholar, Ingenta and other sources. Appropriate keywords and Boolean operators were utilized to ensure a thorough and exhaustive retrieval of pertinent studies.

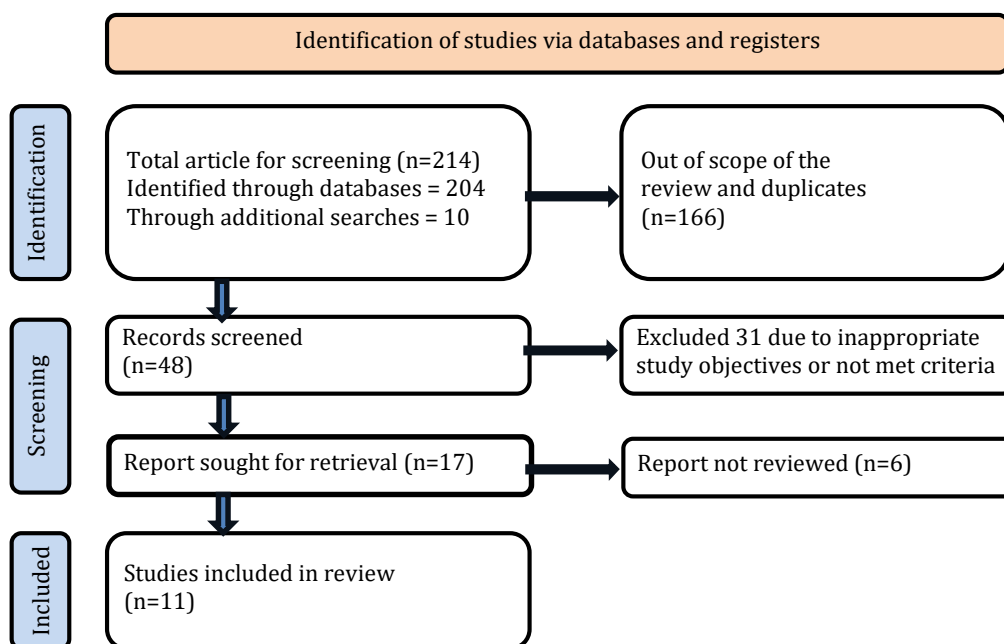


Figure 1: PRISMA flow diagram of the Review Process

The review included studies concerning the 'effectiveness of technology-based gratitude interventions' in promoting 'gratitude', 'mental health', 'wellbeing' and reducing 'psychopathological behaviour' among the participants.

The inclusion criteria for the review were studies that: (1) Investigated the efficacy of technology-based gratitude interventions; (2) Reported outcomes related to the promotion of gratitude, improvement in mental health, or reduction of psychopathological behaviours; (3) Included participants from any community; (4) Published in the English language; (5) Available in full-text format.

Studies were excluded if they: (1) Focused solely on non-technology-based gratitude interventions; (2) Lack relevant outcome measures pertaining to the study objectives; (3) Were not published in English or not accessible in full-text format. Full-text articles meeting the eligibility criteria were retrieved for further analysis. Information related to study design, sample characteristics, intervention details, outcome measures, and results pertaining to the study objectives were explored.

The eligible studies were screened for their titles initially, followed by their abstracts and the whole paper (See Figure 1). Both qualitative and quantitative studies are included in the review. Articles related to technology-based gratitude interventions from the past 10 Years only are included in the review. The studies other than technology-based gratitude interventions as primary objective are excluded from the review. The search fetched a total of 214 studies out of which 197 had to be excluded based on the study objectives. Out of out them, 17 studies were found relevant to technology-based gratitude intervention, and 11 complete studies were retrieved and used for this review.

RESULTS

The systematic review results are organised into three sections, each addressing a specific aspect of technology-based gratitude interventions. The first section discusses studies focused on technology-based gratitude interventions in promoting gratitude. These studies investigated the impact of various technological platforms and interventions on participants' ability to experience and express gratitude. The second section presents studies examining the effectiveness of technology-based gratitude interventions in enhancing mental health. These investigations delved into the potential psychological benefits of utilising technology to foster gratitude. The third section focuses on studies exploring the efficacy of technology-based gratitude interventions in reducing psychopathological behaviour and symptoms. These investigations aimed to assess whether technology-enabled gratitude interventions could serve as an effective adjunctive approach in addressing

maladaptive behaviours and psychological distress. The summary of the studies is presented in Table 1.

Studies concerning technology-based gratitude interventions in promoting gratitude:

The effectiveness of technology-based gratitude interventions in promoting gratitude among the participants was explored by four studies and all of them found that the interventions helped enhance gratitude. A randomised experimental study was conducted in which a context-sensitive smartphone app utilising inspirational content was used to promote gratitude for the intervention.¹⁰ This newly developed smartphone app was used to express gratitude by 29 subjects for a period of 5 weeks. The findings showed that the intervention improved thankful behaviour. Another experimental study was conducted by Koay et al., on gratitude intervention on Instagram.¹¹ The participants posted a picture or caption related to gratitude for seven days. The results showed that Instagram is a promising method to increase gratitude among young adults, but the findings did not support stress and life satisfaction among the participants.

A qualitative study conducted by Godawa et al., on the use of social media and youths' experience of gratitude tried to show the connection between social media use by young people and their perception and understanding of gratitude in 200 college students. The study results showed that the time spent on media impacted the experience concerning gratitude. Also, young people most often experience positive reactions while using social media. Most of the teenagers exhibited positive gratitude activity on social media. Also, female participants are more favourable toward gratitude. An Exploratory study conducted by Walsh, Szymczynska, Taylor, & Priebe in 2018 on the acceptability of an online intervention using positive psychology for depression, conducted in-depth semi-structured interviews among the participants using web-based interventions for depression.¹³ The analysis revealed that acceptability depends on the personal preference to online self-help among the participants. The study also recommended further research to investigate whether online interventions should be matched to patient preferences for psychological content and collaboration and connection with others.

Studies concerning technology-based gratitude interventions in enhancing Mental health:

Out of three studies that explored the effectiveness of technology-based gratitude interventions in improving mental health among the participants, two proved to strengthen optimism, mental health, and well-being. A randomised controlled study on expressing gratitude via instant communication technology on 115 college students with a mean age of 20 years, was found helpful in enhancing optimism and school connectedness.¹⁴ Adair et al. studied about gratitude at work, which is a prospective cohort

Table 1: Summary of the Salient Features of the Studies

Study Details	Independent; Dependent variables	Key Findings
1 Ghandeharioun, et.al., (2016). "Kind and Grateful": A Context-Sensitive Smartphone App Utilizing Inspirational Content to Promote Gratitude. Experimental; N=27.	Smartphone app stimulated gratitude; Sporadic mood measurements, Momentary thankful emotion, Dispositional Gratitude and Psychological wellbeing.	A significant increase in thankful behaviour, dispositional gratitude and psychological wellbeing. The probability of emotional valence is up and down in terms of emotional arousal.
2 Adair et.al., (2020) Gratitude at Work: Prospective Cohort Study of a Web-Based, Single-Exposure Well-Being Intervention for Health Care Workers, Experimental; N=1575 Health workers	Web-based gratitude intervention; Emotional exhaustion, subjective happiness, work-life balance, and tool engagement	Significant improvements in emotional exhaustion, happiness, and work-life balance between the intervention and 1-week follow-up (P<.001)
3 Koay, et al. (2020) Gratitude Intervention on Instagram: An Experimental Study. Experimental; N=33 undergraduate students	Social media-based gratitude intervention; Gratitude, stress and life satisfaction	Results showed higher gratitude levels in the intervention group. Post-measured stress and life satisfaction are not significant.
4 Renshaw & Hindman (2017). Expressing gratitude via instant communication technology: A randomised controlled trial targeting college students' mental health. Experimental; N=115 College students	Instant communication technology gratitude intervention ; Optimism, School connectedness, Depression, Gratitude, Subjective wellbeing and Psychological distress	Results revealed that the intervention group had more significant positive effects on optimism and school connectedness and minor iatrogenic effects on depression and gratitude.
5 Heckendorf, et al., (2019). Efficacy of internet and app-based gratitude intervention, from a randomized controlled trial. Experimental; N=260	Internet and app-based gratitude intervention; The primary outcome was Repetitive negative thinking. Moreover, Secondary results were mental health outcomes and resilience factors.	Participants of the intervention group reported significantly less Repetitive negative thinking. The intervention also affects anxiety and depression by reducing the risk factor of repetitive negative thinking. In contrast, the mediating role of resilience was less clear.
6 Godawa et al., (2019) The use of social media and youths experience of gratitude. Qualitative; N=200 students	Use of social media; Youth experience of gratitude	The study revealed that the internet plays an essential role in shaping attitudes towards gratitude among young people. Also, positive attitude towards gratitude is revealed and explained by the principle of reciprocity.
7 Hernandez, et al., (2018), Feasibility of an Internet-based Positive Psychological Intervention for Hemodialysis Patients with Symptoms of Depression. Experimental; N=14 subjects with depression	Internet-based positive psychological intervention ; Comorbid depressive symptoms.	Significant improvements were evident for depressive symptoms (15.3 vs 10.9; p=0.04).
8 Arps, et al., (2018). Promoting youth mental health via text-messages: A New Zealand feasibility study Experimental; N=136 were older adolescents and young adults	Text messaging program; Gratitude, Life satisfaction, Well-being, Self-esteem, Depression, Anxiety	Results showed positive changes in the general sense of gratitude, subjective wellbeing, and reduced depressive symptoms.
9 Bono, et al., (2020). A new approach to gratitude interventions in high schools that supports student well-being. Quasi- Experimental; N=327 students	Social media app-based Gratitude Intervention; Trait gratitude, mental health, and personal/social wellbeing.	Results revealed that modified intervention showed significant increases in trait gratitude. Increases the wellbeing and decreases the negative mental health.
10 Farrer, L, et al. (2013). Technology-based interventions for mental health in tertiary students: a systematic review. Review of 27 Experimental studies;	Technological device or process-based interventions; Anxiety symptoms or disorders or stress or depression or specific phobia. Other Mental Health Problems and Issues	The findings of this review targeting certain mental health and related problems showed mixed results but offer promise for students in university settings.
11 Walsh, et al., (2018). The acceptability of an online intervention using positive psychology for depression: A qualitative study. Exploratory; Semi-structured interviews of 23 participants	Online interventions; Acceptability of the online interventions.	The results showed that acceptability varied between participants and depended on personal preference towards online self-help interventions.

study of a web-based, single-exposure well-being intervention for healthcare workers.¹⁵ The results revealed that web-based gratitude letter-writing intervention appears promising to improve healthcare workers' well-being. The results also showed a decrease in emotional exhaustion and subjective happiness and exhibited a more outstanding work-life balance, which improved patient safety and quality.

A quasi-experimental study on a new approach to gratitude interventions in high schools that support student well-being.¹⁶ The study revealed that Gratitude intervention classes showed improved trait gratitude, mental health, and personal/social well-being. Students who used the app also demonstrated more grateful personality behaviours and personal engagement. The study recommends research on a larger time frame with samples beyond high school grades and see whether greater intervention dosages would help.

Studies concerning technology-based gratitude interventions in reducing psychopathological behaviour/symptoms:

Research concerning the effectiveness of technology-based gratitude interventions in reducing psychopathology among the participants from a randomised controlled trial was conducted by Heckendorf, Lehr, Ebert, & Freund in 2019.¹⁷ This study explored the efficacy of internet and app-based gratitude intervention on anxiety and depression in 260 subjects for a period of five weeks. The results showed that there is a significant reduction of repetitive negative thinking. Another study conducted on the feasibility of an Internet-based positive psychological intervention on 14 haemodialysis patients with symptoms of depression found that an innovative Internet-based positive psychological intervention represents a feasible and useful therapeutic option for Haemodialytic patients with depressive symptoms.¹⁸

A systematic review was conducted by Farrer et al. in 2013 on technology-based interventions for mental health in tertiary students, for disorders other than substance use and eating disorders, involved 27 studies that met the inclusion criteria for this review.¹⁹ Most studies employed interventions targeting anxiety symptoms or conditions or stress, and a few both depression and anxiety. The findings of this review indicate that technological interventions targeting certain mental health and related problems offer promise for students in university settings. The review recommends more high-quality trials that fully report randomisation methods, outcome data, and data analysis methods.

An experimental study conducted on promoting youth mental health via text messages on 136 older adolescents and young adults showed positive changes over the course of the program.²⁰ These changes were noticed in the subjects' general sense of gratitude, subjective well-being, and in the reduction of depressive symptoms. The results showed that those with higher levels of depressive symptoms

in fact, benefited more from the gratitude program. However, there were no significant differences between the two groups in the magnitude of these mental health changes.

DISCUSSION

The findings from this review emphasise the effectiveness of web-based gratitude interventions in enhancing various psychological parameters. Despite the limited available literature, the studies reviewed consistently reveal positive outcomes associated with technology-based gratitude interventions. These interventions have been shown to successfully promote gratitude, optimism, school connectedness, and mental health. They could help in reducing psychopathological behaviour among the study participants. Regarding the efficacy of technology-based gratitude interventions in promoting gratitude, several studies demonstrated positive results.¹⁰⁻¹² Participants engaged in technology-based interventions reported heightened levels of gratitude, demonstrating the potential of digital platforms to instil a sense of appreciation and positive emotions. These findings highlight the accessibility and convenience of using technology by different people in the community to facilitate regular engagement in gratitude practices, making it a valuable tool in fostering a grateful mindset in individuals thus enhancing their wellbeing and overall functioning.

The studies examining technology-based gratitude interventions' impact on enhancing mental health also provided promising findings.^{14,15} Participants who engaged in these interventions experienced improved mental well-being, with reported reductions in stress, anxiety, and symptoms of depression. The convenience of accessing mental health support through technology, such as telehealth services and digital counselling platforms, proved to be particularly beneficial, especially during the COVID-19 pandemic when traditional in-person services faced limitations in their use, access and coverage. Furthermore, the review revealed that technology-based gratitude interventions effectively reduced psychopathological behaviour and symptoms.^{17,18} Participants showed a decrease in depression and repetitive negative thinking, both common characteristics among individuals with psychopathological conditions. This is possible due the interactive and engaging nature of technology-based interventions which could contribute to promoting positive behaviour change and coping strategies, potentially supporting individuals in managing emotional challenges.

The findings also emphasise the suitability and practicality of technology-based gratitude interventions in the current scenario, where digital platforms are widely preferred over traditional pen-and-paper methods. As more people in the community embrace technology in their daily lives, web-based interventions provide a convenient and accessible means to

engage individuals in gratitude practices. Moreover, the scalability and ease of text messaging interventions make them particularly appealing, with youth showing willingness to participate in mental health text messaging programs.²⁰

CONCLUSION

This review presents a compelling body of evidence supporting the efficacy of technology-based gratitude interventions in promoting gratitude, enhancing mental health, and reducing psychopathological behaviour. Though the review is based on a limited number of studies, the consistent positive outcomes across various psychological parameters suggest that technology-based gratitude interventions hold substantial promise in improving the overall health and wellbeing in the community. Moreover, these interventions offer valuable tools for mental health professionals to integrate into their practice, researchers to advance their investigations, and patients to access effective tools to manage mental health concerns. Additionally, technology-based interventions can be widely disseminated in the general community, serving as an accessible and practical resource to promote positive emotions like gratitude. More research is needed with different populations and future review studies can attempt meta-analytic reviews to highlight important findings.

In conclusion, this study affirms that technology-based gratitude interventions effectively promote gratitude, enhance mental health, and reduce psychopathology risk among participants. The study highlights the potential of utilizing technology to foster positive psychological outcomes and presents valuable implications for various stakeholders, including psychologists, researchers, patients, and the general community. By adopting technology as a means to support emotional well-being, one can enhance gratitude and ultimately contribute to the community's overall health and happiness in the digital age. The implications of these findings extend to mental health practitioners, researchers, policymakers, and individuals seeking practical and accessible means to enhance gratitude and emotional health in the digital age. Moreover, researchers can leverage these insights to enhance the design and implementation of future studies, tailoring interventions to better address the unique needs of diverse populations. As technology continues to evolve, further investigations into novel modalities and platforms are warranted to ensure the sustainability and accessibility of these interventions. By understanding more about technology-based gratitude interventions, we can pave the way for a more resilient and supportive community, where individuals can thrive emotionally and mentally amidst life's challenges.

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REFERENCES

1. Calvo RA, Peters D. Positive computing: technology for wellbeing and human potential. MIT press; 2014.
2. Howells A, Ivtzan I, Eiroa-Orosa FJ. Putting the 'app'in happiness: a randomised controlled trial of a smartphone-based mindfulness intervention to enhance wellbeing. *Journal of happiness studies*. 2016;17:163-85.
3. Konrath S. Positive technology: using mobile phones for psychosocial interventions. In: Yan Z, ed. *Encyclopedia of Mobile Phone Behavior*. Vol 1-3. Hershey, PA: IGI Global; 2015:871-897
4. Riva G, Baños RM, Botella C, Wiederhold BK, Gaggioli A. Positive technology: using interactive technologies to promote positive functioning. *Cyberpsychology, Behavior, and Social Networking*. 2012;15:69-77.
5. Baños RM, Etchemendy E, Farfallini L, García-Palacios A, Quero S, Botella C. EARTH of well-being system: A pilot study of an information and communication technology-based positive psychology intervention. *The Journal of Positive Psychology*. 2014;9:482-8.
6. Mira A, Farfallini L, Banos R, Breton-Lopez J, Botella C. Smiling is Fun, an online intervention for the prevention and treatment of emotional disorders. *Psicobate-Psicologia Cultura Y Sociedad*. 2016;16:51-72. Renshaw TL, Hindman ML. Expressing gratitude via instant communication technology: A randomized controlled trial targeting college students' mental health. *Mental Health & Prevention*. 2017;7:37-44.
7. Emmons RA, Crumpler CA. Gratitude as a human strength: Appraising the evidence. *Journal of social and clinical psychology*. 2000;19:56-69.
8. Emmons RA. Is gratitude queen of the virtues and ingratitude king of the vices. *Perspectives on gratitude: An interdisciplinary approach*. 2016;141-53.
9. Carman JB, Streng FJ. *Spoken and unspoken thanks: Some comparative soundings*. Harvard University; 1989.
10. Ghandeharioun A, Azaria A, Taylor S, Picard RW. "Kind and Grateful": A context-sensitive smartphone app utilizing inspirational content to promote gratitude. *Psychology of well-being*. 2016;6:1-21.
11. Koay SH, Ng AT, Tham SK, Tan CS. Gratitude intervention on Instagram: An experimental study. *Psychological Studies*. 2020;65:168-73. Available at <https://doi.org/10.1007/s12646-019-00547-6>
12. Godawa G, Gurba E, Rzewucka P, Tabor M, Gurba K. The use of social media and youths experience of gratitude, 13th International Technology, Education and Development Conference Proceedings .2019; pp. 3433-3439. DOI: 10.21125/inted.2019.0890
13. Walsh S, Szymczynska P, Taylor SJC, Priebe S. The acceptability of an online intervention using positive psychology for depression: A qualitative study. *Internet Interv*. 2018; 13:60-66. doi: 10.1016/j.invent.2018.07.003. PMID: 30206520; PMCID: PMC6112095.
14. Renshaw TL, Hindman ML. Expressing gratitude via instant communication technology: A randomized controlled trial targeting college students' mental health. *Mental Health & Prevention*. 2017;7:37-44.
15. Adair KC, Rodriguez-Homs LG, Masoud S, Mosca PJ, Sexton JB. Gratitude at work: prospective cohort study of a web-based,

- single-exposure well-being intervention for health care workers. *Journal of medical Internet research*. 2020;22:e15562. <https://doi.org/10.2196/15562>
16. Bono G, Mangan S, Fauteux M, Sender J. A new approach to gratitude interventions in high schools that supports student wellbeing. *The Journal of Positive Psychology*. 2020;15:657-65.
 17. Heckendorf H, Lehr D, Ebert DD, Freund H. Efficacy of an internet and app-based gratitude intervention in reducing repetitive negative thinking and mechanisms of change in the intervention's effect on anxiety and depression: results from a randomized controlled trial. *Behaviour research and therapy*. 2019;119:103415.
 18. Hernandez R, Burrows B, Wilund K, Cohn M, Xu S, Moskowitz JT. Feasibility of an Internet-based positive psychological intervention for hemodialysis patients with symptoms of depression. *Social work in health care*. 2018;57:864-79. <https://doi.org/10.1080/00981389.2018.1523268>.
 19. Farrer L, Gulliver A, Chan JK, Batterham PJ, Reynolds J, Calear A, et al. Technology-based interventions for mental health in tertiary students: systematic review. *Journal of medical Internet research*. 2013;15:e2639.
 20. Arps ER, Friesen MD, Overall NC. Promoting youth mental health via text-messages: a new zealand feasibility study. *Applied Psychology: Health and Well-Being*. 2018;10:457-80.