

ORIGINAL RESEARCH ARTICLE

Visualizing trends on animation art therapy: A bibliometric analysis

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ABSTRACT

By permitting greater user engagement and enhancing user expression, Animation's expressiveness component aids in improving the efficacy of Art Therapy sessions. Although considered an effective approach, literature studies investigating the impact of Animation therapy on users are limited. The aim of this study is to analyse trends in the field of Animated Art Therapy through literature search method. Data using VOSviewer, R, and Biblioshiny for data visualization. The finding shows that Animation therapy is an effective method of regulating mental health and well-being within an artistic medium. Animation therapy can not only help therapists and users solve problems better in the professional field but also guide the public to release psychological pressure and achieve self-healing. Further research is needed on the long-term impact of Animation Art Therapy and trends, highlighting the possibilities and development prospects of disciplinary integration.

Keywords: animation art therapy; user; bibliometrics analysis; mental health; well being

ARTICLE INFO

Received: 21 September 2023
Accepted: 30 October 2023
Available online: 20 March 2024

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1. Introduction

The fusion of clinical research and technological advances has enabled the integration of art as a therapeutic technique within medicine and science^[1]. Art Therapy enables individuals to extend their identity beyond the limitations of their ailment, increasing their self-confidence and optimism^[2]. The audio-visual art form of Animation has a unique value in the realm of Art Therapy. Animated healing denotes the process encourages clients to express themselves in creative manners. The adaptability of Animation as a therapeutic intervention allows for modifications in line with the client's interests, fostering engagement and creating opportunities for expression. Animation comprises a blend of visual and performing arts in a spatiotemporal context, integrating aspects of psychology as it mirrors the phenomena of real life. Animation functions as both a stage effect and a narrative. The "healing" element of Animation can be utilised as a language to map emotions and connect with the viewer's sentiments. Animation Therapy harbours the potential to regulate emotional healing among users. Its combination of interactivity and navigation can amplify the attentiveness factor within the therapeutic session. Indeed, Tang^[3] uncovered that the visual components of Animation can assist young individuals diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) to better perceive and engage emotionally and visually while, in another study, Li et al.^[4] determined that immersive interactive Animation holds a strong appeal for users. Participants reported experiencing

comfort, satisfaction, and happiness while engaging with the animations. The therapeutic benefits of Animation Art Therapy extend to a wide audience, offering emotional support and healing for those coping with trauma or other distressing experiences. The creative process can afford relaxation and stress alleviation. A rising body of evidence suggests that art therapists are increasingly employing digital media for both personal and professional purposes, particularly with a therapeutic focus^[5,6].

The purpose of this research paper is to investigate the use of animated art therapy in different user groups and to explore the trends and impact of animation in the field of art therapy. Although there is a burgeoning body of research positing that Animation Art Therapy can serve as an efficacious therapeutic instrument, a review paper on digital technology and Art Therapy underscored the paucity of research investigating Animation's application in this domain^[7]. Moreover, there is a clear need for longitudinal studies examining the impact, trends, themes, content, and potential risks and benefits associated with Animation Art Therapy. In addition, while research indicates that artistic activities can positively impact well-being, the majority of these studies have focused on arts interventions in group settings. More research is required to outline the benefits of Animated Art Therapy for other user groups and to better understand its effectiveness in supporting diverse types of users^[8]. One bibliometric study mentioned visual arts and Animation within the context of Art Therapy, thereby enriching the knowledge base of Art Therapy^[9]. Another review summarised the effects of animation on people's perceptions and emotions, showing that animation helps people with emotional healing and arousal^[10]. However, no studies have explicitly highlighted the role of Animation in Art Therapy with users. In line with this, this study aims to elucidate the benefits of Animated Art Therapy for users by summarising the current knowledge base. Consequently, the following research questions have been developed to explore the relationship between Animation Art Therapy and its users. Consequently, this research seeks to aggregate and synthesise the existing research literature that explores the multifaceted role of Animation Therapy for users. Past researchers have recommended the formulation of a specific research question and the selection of a sub-theme for investigation^[11,12].

RQ1: What are the relevant subjects and users involved in Animation Art Therapy?

RQ2: What constitutes the content and characteristics of research conducted on Animation Art Therapy and its users?

RQ3: What benefits do users derive from Animation Art Therapy?

The study holds paramount importance as it contributes significantly to existing knowledge about Animation Art Therapy trends. Through bibliometric analysis, this research identifies prevalent themes and terms in the field, shedding light on crucial aspects like the therapy's impact on users. This comprehensive understanding not only informs researchers about the field's current status but also distills common experiences and methodologies. These insights serve as valuable markers for potential future research endeavors in the realm of Animation Art Therapy.

2. Literature review

While bibliometric and systematic review studies on Animation Art Therapy and its users exist, they remain relatively sparse, and many of these studies integrate Animation within the broader discussion of digital art for Art Therapy rather than isolating Animation as a distinct approach within the practice of Art Therapy. For instance, numerous studies underscore the significance of digital culture for Art Therapy, incorporating indigenous skills and learning activities^[13,14]. Indeed, Malchiodi's^[15] definition and summary of Digital Art Therapy encompasses all technology-based media, including Animation, Games, and Virtual Reality. It examines how these techniques can be harnessed within the scope of Art Therapy interventions and postulates their potential therapeutic impact. In another study, Orr's^[16] work synthesised the therapeutic

potency of art and scrutinised the usage of digital art in Art Therapy projects and its associated values. This research highlights that adolescent users of Animation projects reap cognitive and developmental benefits. As these users' interest in Animation increases, so does their engagement in therapy; also discusses how such interest can transition into educational pathways, enabling users to master animation skills and enhance their educational outcomes. In their study, Asghar et al.^[17] carried out a bibliometric analysis of Digital Art interventions for users with aphasia. This analysis incorporated papers from seven English language databases and referred to Web-orka, a programme that communicates with patients through animated characters. This program was designed for users through Digital Art Therapy, utilising virtual environments to facilitate practice. This literature study contributes to our understanding of digital art dynamics, such as Virtual Reality and Animation within a therapeutic program context, as well as to the analysis of related knowledge fields. In their study, Liu et al.^[18] using VOSviewer software, conducted a bibliometric analysis of articles from the Web of Science and Google Scholar databases pertaining to the research domains of Art Therapy, Digital Art, and environmental landscapes. Their findings suggest that Art Therapy principles can more effectively enhance human health and summarise the potential benefits of integrating current Art Therapy with animation technology.

3. Methodology/materials

A bibliometric analysis is a valuable method for capturing the state of knowledge on a specific topic using a rigorous and scientific approach. This chapter first outlines the search strategy, followed by a discussion on the selection criteria and the assessment of data quality, concluding with the analysis of the data. We analysed the literature using a mixed-methods approach to characterise articles published on art therapy in animation over a 10-year period.

3.1. Search strategy

In this study, adhering to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) was conducted utilising Scopus, Web of Science, and PubMed databases. The review was based on 1253 records sourced from 882 journals^[19]. To identify relevant studies, we employed Boolean logic using the following keywords: (“Animation Art Therapy” OR “Animation Art Healing” OR “Animated Healing” OR “Animated Therapy”) AND (“user experience” OR UX) AND (“Animation design” OR “Animation art”). The search spanned across arts and humanities, psychology, and multidisciplinary fields. Each publication's abstract was scrutinised to assess its title and content's alignment with the objectives of this systematic review.

3.2. Criteria and assessment

Studies that incorporated art or Art Therapy into an Animation design or Animation Therapy project and those written in English were deemed eligible for inclusion in this review. The selected literature encompassed user groups of varying ages, including individuals experiencing mental health issues. Other reasons for the evolution of Virtual Reality Art Therapy, such as duplicate research, studies with partial availability, and literature reviews, were initially selected but were not included in the final version. The inclusion and exclusion criteria for the search are listed in **Table 1**.

Table 1. Checklist for Inclusion/exclusion criteria.

No.	Inclusion Criteria	Exclusion Criteria
1	They used Animation in Art Therapy	They have not used Animation in Art Therapy
2	They were written in English	They were not written in English
3	Articles with access to the full text	Articles with no access to the full text

Table 1. (Continued).

No.	Inclusion Criteria	Exclusion Criteria
4	They mentioned or evaluated UX in Animation Therapy	They were not mentioned or evaluated UX in Animation Therapy.
5	They are not review-type articles	They are review-type articles
6	They are not short reports	Short reports

3.3. Analysis process

A quality assessment was performed to identify the final articles for review, which was over and above the assessment based on eligibility criteria. The assembled studies were evaluated using the QualSyst criteria. These 14 criteria are used to examine the feasibility of the study design, research queries, participant selection, sample size, findings, and conclusions^[20]. This report, related to the treatment and viewer experience of Animation arts, aims to investigate research queries that explore new themes, emerging trends, and potential future directions. The “biblioshiny” tool, which allows “word frequency” and “trending topics” document analysis, provides a visual representation of textual data from refined literature. R Studio was used for the visual analysis and classification of user populations in the literature, allowing scientific analysis of the research outcomes of the multidisciplinary database^[21]. Data analysis was carried out using VOSviewer’s visual map of term co-occurrence analysis, co-word analysis of Animation Art Therapy, histograms in R Studio for data analysis, bibliometric mapping analysis in R for the subject area, and trending topic analysis. The researcher employed VOSviewer designed to create and display bibliometric maps, to analyse citation data, and to plot trends^[22]. R with an extensive range of statistical functions, was endorsed as an exceptional choice for scientific computation^[23,24]. The package “bibliometrix” provides a more comprehensive analysis than other existing scientific mapping analysis tools. In addition, “Biblioshiny” or shiny app offers a web interface to “bibliometrix” to access some analyses. The literature was reviewed using Rayyan, a web-based tool for systematic review of multiple randomised controlled trials, offering a summary of the effects of specific outcomes and providing quantitative data on the effectiveness of therapy^[25]. The 1253 records were acquired through database search and reference list checking, and comprised articles from 882 journals, utilising studies from three databases and sixteen countries. The PRISMA guidelines, shown in **Figure 1**, outline the selection and screening process followed in this study. Following the application of inclusion and exclusion criteria, 32 papers with 129 authors were identified that aligned with the research content of this review, as displayed in **Table 2**.

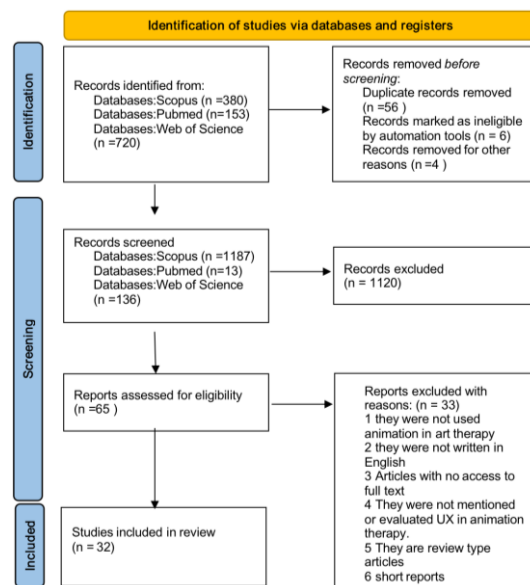


Figure 1. Prisma flow^[26].

Table 2. Included articles.

No.	Title	Reference
1	Developing a Web-Based Comic for Newly Diagnosed Women With Breast Cancer: An Action Research Approach	[28]
2	Stop-motion storytelling: Exploring methods for animating the worlds of rare genetic disease	[29]
3	The Tool and the Relationship: A Qualitative Study of the Effects of Interactive Display Devices on Therapy with Children	[30]
4	Animation in Therapy: The innovative uses of haptic Animation in clinical and community therapeutic practice	[31]
5	Computer Animated Relaxation Therapy in Children Between 7 and 13 Years with Tension-Type Headache: A Pilot Study	[32]
6	Application of Animated cartoons in reducing the pain of dressing changes in children with burn injuries	[33]
7	Claymation Art Therapy in early phase psychosis: A qualitative study to explore participants' experiences with the program and identify outcome effects identify outcome effects	[34]
8	The effectiveness of brief Animated films as a scalable micro-intervention to improve children's body image: a randomised controlled trial	[35]
9	Helping Patients With Head and Neck Cancer Understand Dysphagia: Exploring the Use of Video-Animation	[36]
10	The Effects of Designing an Educational Animation Movie in Virtual Reality on Preoperative Fear and Postoperative Pain in Pediatric Patients:AR randomized Controlled Trial	[37]
11	Evaluating Animated Characters: Facial Motion Magnitude Influences Personality Perceptions	[38]
12	Animation Narrative on Stress Relief and Psychological Cognitive Development in Adolescents	[39]
13	The Development of Primary School Pupils' affection by Using Animated Cartoon as the Therapy	[40]
14	Effect of Animation Distraction on Pain Response during Venepuncture among Children	[41]
15	Designing a Two-Dimensional Animation for Verbal Apraxia Therapy for Children with Verbal Apraxia of Speech	[42]
16	Does Animation Facilitate Understanding of Graphic Symbols Representing Verbs in Children With Autism	[43]
17	Efficacy of cartoon viewing devices during phlebotomy in children: a randomized controlled trial	[44]
18	Text Mining of Movie Animation User Comments and Video Artwork Recommendation Based on Machine Learning	[45]
19	The Animation Project: School-based drama therapy and 3D digital storytelling with adolescent populations	[46]
20	The effect of conventional oral health education versus animation on the perception of Saudi males in primary school children	[47]
21	The Animated assessment of theory of mind for people with schizophrenia (AToMS): development and psychometric evaluation	[48]
22	The effectiveness of multimedia learning tools in education	[49]
23	The Good Hearts Model (GHM): an investigation into the extension of Animation Therapy; the GHM method with digital storytelling and jewellery	[27]
24	Development and mixed-methods evaluation of an online Animation for young people about genome	[50]

Table 2. *(Continued).*

No.	Title	Reference
25	Impact of Animated objects on autistic and non-autistic users	[51]
26	Analysis on the Art Therapy Function of Animated Documentary Films	[52]
27	Humor and Fear Appeals in Animated Pedagogical Agents: An Evaluation in Aviation Safety Education	[53]
28	Evaluation of an internet-based Animated preparatory video for children undergoing non-sedated MRI	[54]
29	Art Therapy and digital media	[15]
30	Art Therapy: Intervention Study of Immersive Interaction Animation on Children with ADHD	[3]
31	The effectiveness of animation program with cognitive behavior approach on anxiety symptoms of children: A case study	[55]
32	Loved and lost': Animation as a methodology for understanding and making meaning of loss for a group of adults with learning disabilities	[56]

4. Results and findings

The following chapter presents the outcomes of the bibliometric analysis concerning the current status of research on user experience in Animation Therapy within educational settings. This study examined several dimensions, including subject area, geographic distribution based on publication frequency, pertinent topics within Animation Art Therapy, and the content and characteristics of research dedicated to Animation Art Therapy and its users. The confluence of traditional Art Therapy and new media technology constitutes one of the foundational concepts of Animation Therapy. In addition a flexible and potent participatory technique, Animation Therapy has demonstrated efficacy in diverse contexts. It amalgamates narrative and creative processes with technological application to yield positive outcomes, employing methodologies such as briefing and story cycles, writing, recording, editing, and sharing^[27]. Simultaneously, Animation Therapy involves the appreciation and analysis of films, cartoon characters, and animated films that engage and immerse viewers, also can have an impact on the audience's perceptions and emotions^[10].

4.1. Document type on publications frequency

The publications released on Animation Art Therapy are divided into three document types, as shown in **Table 3**, it is shown that most publications are articles, with a total of 27% or 84.38%, followed by progress reports with 3% or 9.38%, followed by early articles with 2% or 6.25%. These results imply that within a specific time period, the publication served as the main published source for study in the area of Animation Art Therapy.

Table 3. Type of animation therapy's publications frequency.

Document Type	Total Publications	Percentage (%)
Artcile: Early Access	2	6.25%
Artcile	27	84.38%
Proceedings Paper	3	9.38%
Totle	32	100.00%

4.2. Country distribution on publications frequency

Table 4 shows that of the 32 papers reviewed, 16 countries were involved in the research, with China in the first place, the USA placing in second, and the UK in third place, indicating that these countries are leaders in the field of Animation Art Therapy research. These national studies have played a significant role in the advancement of the field of Animated Art Therapy, and the insights they have produced have advanced the understanding and awareness of it while also broadening the field's theoretical and practical foundations.

Table 4. Regions of animation therapy's publications frequency.

Region	Frequency
CHINA	38
USA	23
UK	20
FRANCE	4
DENMARK	3
INDIA	2
PORTUGAL	2
TURKEY	2

Table 4. Regions of animation therapy’s publications frequency.

Region	Frequency
AUSTRALIA	1
IRELAND	1
ITALY	1
RUSSIA	1
SLOVAKIA	1
SOUTH AFRICA	1
SOUTH KOREA	1
SWEDEN	1

4.3. Subject area

Of the 32 entries subjected to bibliometric analysis, Animation emerged as the predominant subject area, accounting for 14% of the total entries. These include a wide range of subtopics such as digital animation, animated documentaries, cartoons, and animated films (refer to **Figure 2** and **Table 5**). Contributions from scholars such as Tornøe and Skov^[32], Dyshej^[40], Feng et al.^[33], and Divya and Danieal^[41] underscore the potential therapeutic benefits of Animation. In their study, they explored the efficacy of Animation and cartoons as distractors for younger audiences. A notable study, synthesising animated depictions of natural landscapes and instrumental music, demonstrated a reduced perception of pain among paediatric surgical patients, with the therapeutic effect of animation found to surpass that of verbal or pictorial explanations^[39].

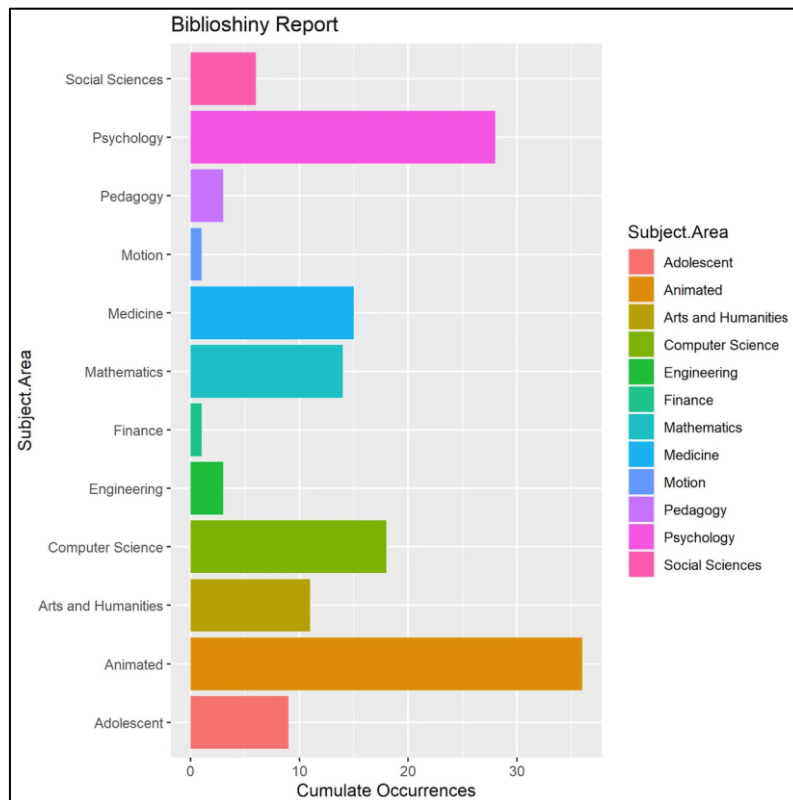


Figure 2. Subject area.

Table 5. Animation art therapy subject area.

Subject Area	Total Publications	Percentage (%)
Animation/Animated	7	14.00%
Psychology	6	12.00%
Computer Science	5	10.00%
Engineering	3	6.00%
Arts & Humanities-other topics	2	4.00%
Education & Educational research	2	4.00%
General & Internal medicine	1	2.00%
Psychiatry	1	2.00%
Rehabilitation	1	2.00%
Social Sciences-other topics	1	2.00%
Telecommunications	1	2.00%
Art	1	2.00%
Audiology & Speech-language pathology	1	2.00%
Biochemistry & Molecular biology	1	2.00%
Biotechnology & Applied microbiology	1	2.00%
Cell Biology	1	2.00%
Cultural Studies	1	2.00%
Emergency Medicine	1	2.00%
Food science & technology	1	2.00%
Genetics & Heredity	1	2.00%
Health Care sciences & services	1	2.00%
Linguistics	1	2.00%
Materials Science	1	2.00%
Medical Informatics	1	2.00%
Neuroscience & Neurology	1	2.00%
Nursing	1	2.00%
Pediatrics	1	2.00%
Radiology Nuclear medicine & medical imaging	1	2.00%
Respiratory System	1	2.00%
Social Issues	1	2.00%
Social Work	1	2.00%
Sociology	1	2.00%
Theater	1	2.00%

Psychology also emerged as a significant discipline, accounting for 12% of the relevant literature. A representative study dissected the psychological implications of colour usage in Animation, illuminating how specific colours can stimulate distinct emotional responses from the audience. For instance, red and yellow can incite excitement, while blue and green tend to elicit feelings of calm and stability^[39]. The animation's visual style, drawing upon the themes and cultural connotations of renowned artists like Chuck Jones, Laiming Wan, and Miyazaki Hayao, also leaves a significant impression on the viewer. In addition, 10% of the entries correspond to the field of computer science. One representative research article explored the use of a computerized biofeedback system to generate animated screens that reflect children's behaviour, directing their attention towards audio-visual stimuli^[32].

Overall, this bibliometric analysis reveals a research landscape largely dominated by Animation, although the disciplines of psychology and computer science also contribute significantly to the discourse on Animation Art Therapy.

4.4. The relevant topics and users in Animation Art Therapy

As shown in **Figure 3**, terms such as Virtual Reality, Art Therapy, and controlled trials frequently appear in the context of Animation Therapy. Animation can assume myriad forms, encompassing stop-motion, 2D and 3D Animation, and hybrids with comics, along with Virtual Reality animation. As an inherently captivating medium, Animation has shown significant potential for engagement with users^[28,29]. Interestingly, between 2021 and 2022, phrases such as “controlled trials” and “Virtual Reality” have gained prominence. This trend indicates that the amalgamation of Virtual Reality and Animation Therapy may offer substantial benefits to users, a hypothesis possibly driving recent researcher interest.

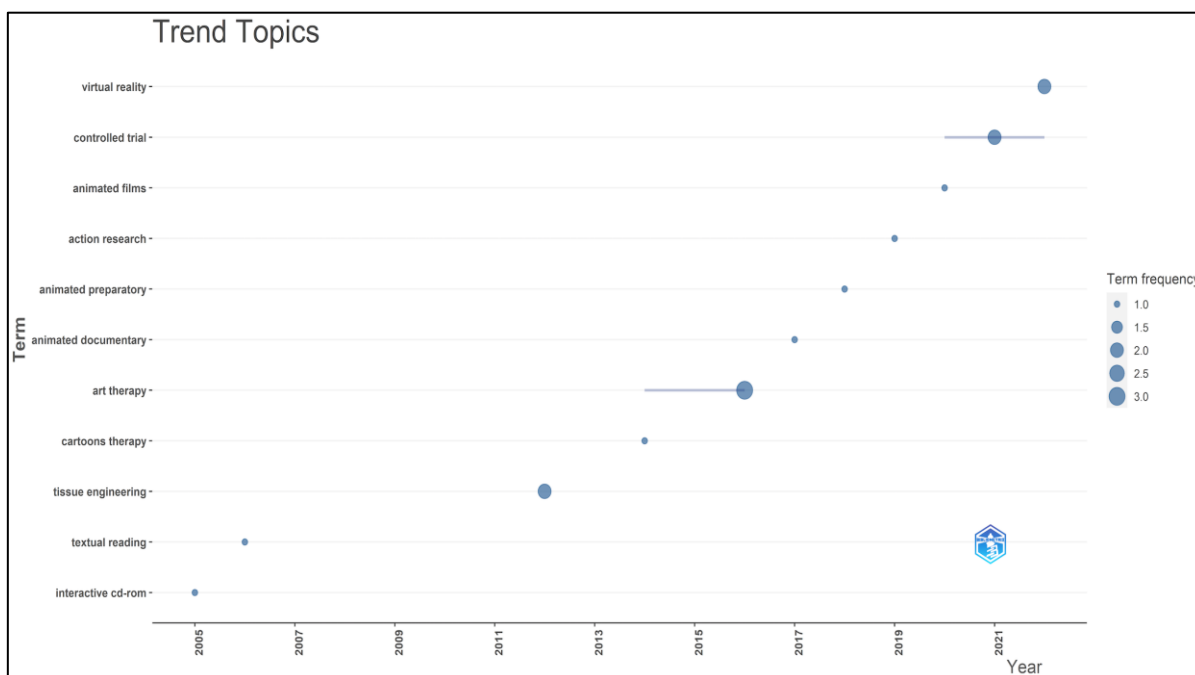


Figure 3. Trends topics.

The synergy between Animation and Virtual Reality constitutes one of the most intriguing facets of Animation Therapy. Virtual Reality technology has presented users with a novel perspective on Animation, amplifying its expressive power. In terms of artistic Animation design, this technological evolution facilitates the creation of scenes resonating more harmoniously with the user’s emotional landscape, thereby improving the efficacy of Virtual Reality-integrated Animation technology and fostering deeper audience immersion^[4]. Reportedly, Animation art design has been employed to generate virtual Animations aiding patients in surmounting psychological barriers through Animation Therapy^[30]. Ashworth and Reg’s^[31] project demonstrated the potential of Animation techniques across diverse therapeutic contexts to enhance clinical outcomes and foster therapeutic alliances. Animation, a versatile mode of expression, can be created and viewed using computers or traditional art forms and the accessibility afforded by the internet, along with the plethora of choices a simple mouse click can yield, can significantly benefit users. According to Tornøe and Skov^[32], children’s experiences with Animated treatment and a controlled study investigating the efficacy of computer-animated Relaxation Art Therapy in children aged 7–13 with tension-type headaches were promising. The study reported that while the control group adhered to standard procedures, the intervention group incorporated Animated cartoons into their routine. The findings suggest that encouraging children to

watch cartoons could be a viable strategy for mitigating pain during dressing changes in paediatric burn units^[33].

To enhance their intervention, Ursuliak et al.^[34] explored various stop-motion Animation techniques with a professional animator. In this setting, users engaged in Animation Art Therapy activities while the art therapist highlighted the therapeutic potential of artistic emotional expression. In another analysis, a controlled experiment was conducted to enhance users' physical well-being and increase public interest in Animation^[35].

A study promoting controlled experiments with 3D Animation and patients suggested that video Animation could outperform other art forms such as illustrations in enhancing patient comprehension, although the study noted that the effectiveness of Animation should be individually tested for distinct audiences and disease states^[36]. Other relevant controlled experiments underscore the distraction effect of Animation in pre-surgical patients, highlighting the potential benefits of Animation Therapy for various user demographics^[37]. The majority of the literature included in this review discusses the interrelations among Animation Therapy, Art Therapy, and Virtual Reality. These associated topics contribute to the encouragement of creativity and the development of novel skills, all playing a role in the evolution of Animation Art Therapy and its efficacy as an intervention for various user groups. Collectively, the studies included in this review advocate for the effectiveness of Animation Art Therapy as an intervention. The word co-occurrence analysis of the literature, illustrated by the network visualisation graph created using VOSviewer, organised data from a total of 347 articles into 6 distinct clusters (as shown in **Figure 4**). In this graph, differently coloured nodes symbolise the distinct clusters to which the research belongs, and the size of these nodes represents the distinct research topics. The larger the node, the more frequently the keyword appears; the closer two nodes are, the stronger the connection between them.

Figure 4 shows that the six clusters are grounded on the keywords “Virtual Reality”, “human”, and “Therapy”. These keywords indicate two principal perspectives and five research directions in Animation Therapy. The first cluster is centered around the red keyword “Virtual Reality”, the second around “Therapy”, and the third around the blue keyword “human”. The fourth cluster incorporates yellow keywords pertaining to physiology and emotions, it is composed of purple keywords related to computer interfaces, and the sixth includes light blue keywords tied to the COVID-19 pandemic. Cluster 1 encompasses high-frequency terms such as Animation and Virtual Reality within the context of user experience, art computer, games, and application programmes, artificial intelligence, among over 100 other terms indicative of the content and research domains of Animation Art Therapy. Within the clusters, demographic words such as “adult”, “child”, and “youth” are prevalent, particularly with a dominance of adult populations. This correlation between research hotspots denotes a significant relationship between Animation Art Therapy and its users, suggesting the potential benefits and effectiveness of Animated Art Therapy across a broader user demographic. Furthermore, words detailing the characteristics and information of Animation Therapy users are also present. These findings underscore the relevance of Animated art in education and therapy for diverse user groups. The user experience can be enhanced via the integration of Animated art and digital technologies such as Virtual Reality.

can transmit the cultural implications of an Animation. Artists often infuse characters with individuality and contagiousness, reflecting their creativity and knowledge. Therapy-focused Anime frequently features protagonists with realistic personas, making Animation Therapy more engaging and accessible to users and viewers^[39]. Consequently, the artistic design of Animated characters can catalyse shifts in users' attention and perception.

One empirical study examined how participants engage with Animation Therapy by watching cartoons. The guiding principles of this engagement are the psychological mechanisms of identification and projection. Children often interact, empathise, and resonate with their favourite characters at a subconscious level. Psychologists have identified a therapeutic effect within animated television, noting that Animation serves as a healing medium for users. A further extension of this therapeutic interaction is the activity "We are the animators-Creative arts events"^[40]. Here, participants develop the plot, portray the main characters, and then act them out, culminating in a framework for the story. This activity exhibits the characteristics of Animation Therapy and provides evidence for the positive impact of Animation Art Therapy on children's mental health and mood.

4.6. Content and characteristics of research on animation art therapy and users

This section outlines the individual benefits users garner from the process of Animation Therapy. Animation Therapy prove beneficial for specific demographic groups. For instance, Animation projects tailored to represent patients' feelings, cognition, and lived experiences with breast cancer have demonstrated efficacy in conveying cancer treatment options and recovery information^[28]. Furthermore, Animation proves advantageous for users with learning difficulties, where the process facilitates subconscious control and engenders a deeper, nuanced understanding of the world^[56]. In their study, Ali et al.^[57] found Art Therapy to be a viable intervention that provides stroke patients with a safe, supportive environment to alleviate their anxiety. In another study, Edmunds^[58] discerned that Animation serves as a familiar medium for young people, one that is interactive and therapeutic, employing new media to foster interpersonal relationships and therapeutic bonds. Building upon this, the literature incorporated in this paper not only accentuates the benefits of Art Therapy to the user but underscores the significance of Animation as a therapeutic medium. Animation Therapy offers users a cathartic avenue to achieve relaxation and equilibrium of body and mind. In addition, Animation Art Therapy encourages individuals to express themselves visually, narrating their personal stories and experiences.

As shown in **Figure 5**, this review integrates literature with a diverse range of users, including preschool children, school children, students, and parents. Each category of users can potentially derive a unique experience from Animation Therapy, the majority of whom express substantial satisfaction with Animation-based interventions. Predominantly, young participants deem Animation as 'enjoyable', 'comprehensible', and engaging. The medium is found to elicit relaxation and other beneficial effects, whether employed in therapeutic or educational contexts^[50]. Animation Therapy integrates the artistic attributes of Animated audio-visual media, augmenting the user's visual pleasure, thus enhancing the individual's enjoyment of the therapeutic process and culminating in a more holistic experience. **Figure 6** shows the varying number of participants in the literature included in this review, spanning from a minimum of 2 participants to a maximum of 1329. **Figure 7** shows the diverse age range of users who can participate in Animation Therapy and achieve optimal outcomes, extending from preadolescents to adults. Animated therapy can be tailored effectively to address the needs of adolescent users. For instance, Kim and Park^[59] adopted a sequential approach to Art Therapy to address the multifaceted issues arising from excessive usage of video games and other media by children and adolescents, achieving significant results.

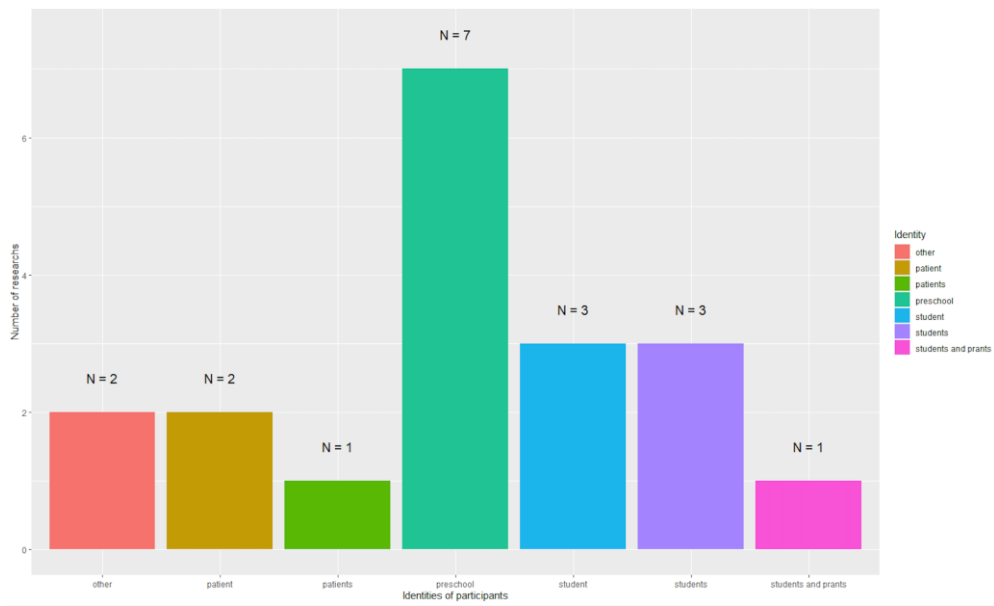


Figure 5. Identities of participants.

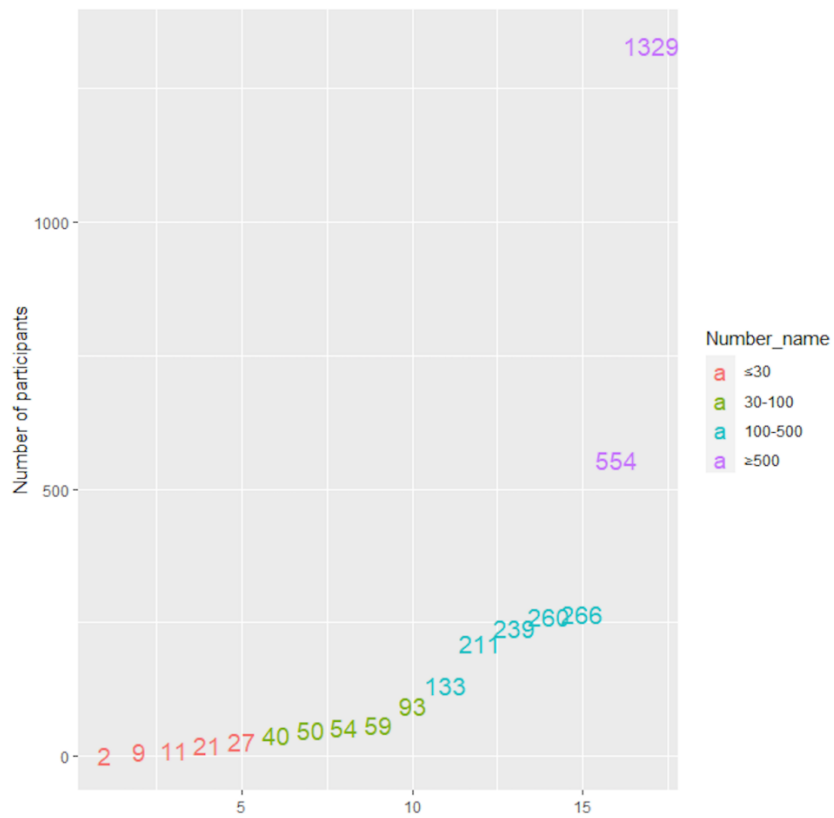


Figure 6. Number of participants.

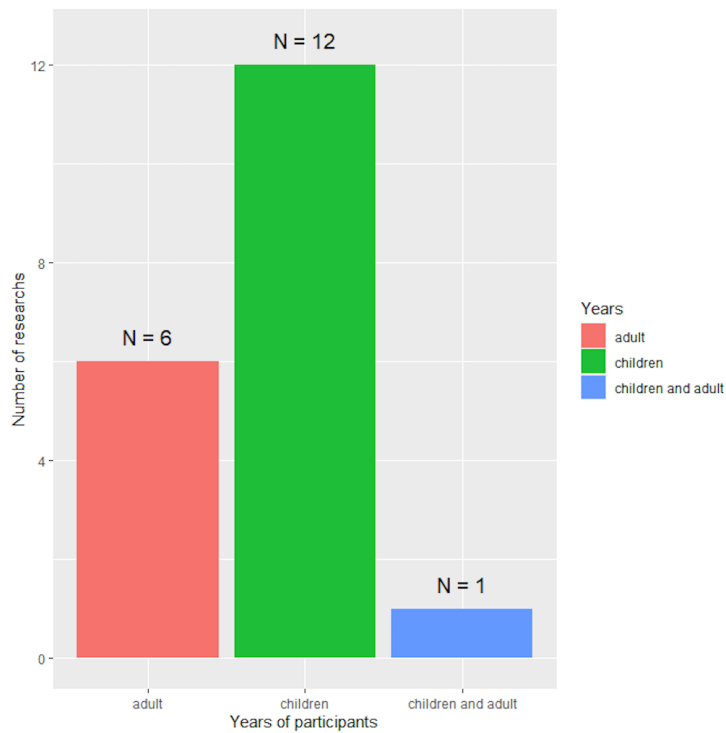


Figure 7. Age of participants.

For the current generation of children and adolescents, Animation and other new forms of media constitute integral elements of daily life^[60]. Children’s familiarity and fascination with Animation lend this medium a particular advantage. In particular, the captivating imagery of Animation encourages children to explore new subject matters. Given that 2D Animation Therapy projects can traverse a multitude of domains, including social, societal, and even scientific and technical aspects, they hold implications for scientific and educational disciplines. For instance, an Animation Therapy project was developed for children grappling with speech and language difficulties^[42]. In addition, another study determined that children with autism and autism spectrum disorders demonstrated improved verb recognition when symbols were animated as opposed to static, underscoring the potential of Animation in clinical settings^[43].

Emilia^[61] offered a compendium of Art Therapy techniques, inclusive of multimedia and Animation. To furnish a theoretical foundation for interdisciplinary exploration of Animation arts in the realm of ADHD treatment, Tang^[3] scrutinised clinical experiences associated with the pathology of children with ADHD, focusing on an analysis of specifications, designs, and methodologies of immersive interactive animation deployment. Another study leveraging Animation to instruct children in brushing their teeth concluded that Animated films serve as a more effective and sustainable medium for delivering oral health messages compared to conventional methods^[47]. One study confirms that watching animation can reduce children’s anxiety and even their pain^[44]. Animation Therapy can also have a positive impact on children’s body image by giving them an understanding of the diversity of their bodies through viewing the Animation, thus improving their self-esteem and body satisfaction^[35]. The reasons for the impact of Animation Art Therapy on children are related to the art form of Animation. The most meaningful and practical way to engage children in learning was through Animation. Animation Therapy may also serve an educational purpose for children. In one instance, Animated characters were employed to deliver a message to young users. Post-viewing, children exhibited a substantial increase in topic knowledge and displayed a particular affinity for versions featuring animated characters^[62,63].

Many young people admire and appreciate Animation in both cinema and television, which is a unique form of video art^[45]. Animated treatments can have an impact on the emotions of the user. They affect young people's emotions in their perceptual roles and can change with the environment in which they live. Shown.

When creating scenes, Animation artists mix style with story emotions and manipulate realistic colors to better express emotions visually and convey the mood of the subject. The study found that most artists use similar emotions when creating scenes, especially bright colors in scenes depicting beautiful healing. In Animated scenes, the light and shadow effects enrich the scenes by processing scattered scenes and overexposed images, which creates a vivid and warm aesthetic impression and gives the Animation users a pleasant experience^[39]. The Animation Project, an organization that works with young people in schools and clinics to provide digital Animation creation and training in a therapeutic setting, explores how the model works in schools and explores issues of vulnerability and resistance in projects that support marginalized young people. Animation Therapy has been shown to increase users' confidence and identity/role expansion^[46]. When users are diagnosed with breast cancer, Animated films highlight issues such as feelings, emotions, and thoughts, Animation Art Therapy and provide a communication medium to explain the steps in the process^[28]. An Animated assessment of the mental state of schizophrenics, such as cognitive and emotional concepts, has been satisfactorily presented in one study^[48]. The project is presented in an Animated form and provides an understandable, patient-friendly, and contextualized measure of motivation for people with schizophrenia. Users' feelings and experiences are important in Animation Therapy because they can directly influence the effectiveness of Animation Therapy. By creating Animations, people can express their emotions, and by watching Animations, they can experience fictional stories and images. Emotional catharsis and emotional compensation represent foundational techniques commonly utilized in the domain of Animation Therapy^[64]. Individuals facing emotional and affective challenges often require empathetic understanding and support, making emotional catharsis a vital outlet for them to express and navigate their intricate emotions. This therapeutic approach forms an integral part of animation art therapy practice, offering individuals a means to engage with and address their emotional struggles effectively.

However, some art therapists reject interacting with young people through technology. Gerity urges art therapists to stay away from seductive technologies such as video games and computers, believing that they deprive children of authentic creative experiences; there are some children who do not manage their time^[14,65]. In addition, some elements of Animation may have had a non-obvious negative effect on some patients in terms of face selection^[51]. Despite this viewpoint, Overall, the evidence suggests that Animation Art Therapy has potential therapeutic value in helping people to better regulate and communicate their emotions^[66]. The benefits of Animation Therapy include helping patients to process unpleasant emotions, gain an understanding of their own behavior, explore their identity and relationships with others, and increase their self-esteem. However, one of the drawbacks is that Animation Art Therapy is a relatively new subject, and there is currently little data on its effectiveness. Further research is needed to better understand the effectiveness of Animation Therapy in helping people with different mental health problems or healthy populations and to identify potential risks and benefits associated with the use of Art Therapy^[67]. In addition, research is needed to identify areas and trends, such as new topics or methods and content of Animation Art Therapy. The field of animation therapy is currently undergoing significant development and innovation^[68]. Exploring the integration of various forms of animation technology with psychotherapy is an ongoing area of research. The emerging trend of amalgamating animation with other therapeutic techniques represents a novel breakthrough for the field of animation art therapy.

5. Conclusion

The findings of this bibliometric study identify the growing role of Animation in art therapy and the intersection with fields such as computer science and psychology, identifying potential benefits and challenges, including the impact on the therapeutic process and user relationships. Recent trends indicate a rise in interest, especially in Animation combined with Virtual Reality and Animation Therapy informed by Art Therapy principles. The prevalence of Animation in our culture has intensified research into human-

Animation interfaces. In closing, it is crucial to acknowledge the limitations inherent in this overview of Animation Therapy. This review does not purport to be exhaustive. Indeed, numerous other comparable works likely exist. The material referenced in this report is the outcome of a specific search strategy (i.e., specific keywords on Animation Therapy), and alternative strategies may yield different literature with varied perspectives. Considering the diverse age groups addressed in the literature reviewed. Future research endeavors should be customized to investigate the unique traits associated with various age categories. Additionally, exploring the emotional and interpersonal effects of animation on users warrants further exploration. Delving into these dimensions not only deepens our comprehension but also directs targeted interventions to cater to the intricate requirements of diverse user groups. For example, future research may explore the innovative and immersive facets of Animation Therapy for education and student users, maximising the symbiosis of Animation and audio-visual media. Finally, Art Therapy employing Animation could yield better results when amalgamated with other new media technologies.

Conflict of interest

The authors declare no conflict of interest.

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