Research Proposal

Project Title

Unlocking Limitations through Arts: A Mixed Methods Study on the Effectiveness of an Expressive Arts-based Intervention on Psychosocial Wellbeing of Adults with Age-related Visual Impairment

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2

Investigators

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Estimated Duration and Commencement Data

Project start date: 31 March 2023
Proposed study completion date: 31 December 2025
Expected final report date: 30 June 2026

Project Objectives

The **primary objective** of the present study is to investigate the effectiveness of an expressive arts-based intervention, with reference to a treatment-as-usual, waitlist control group, on persons with visual loss due to age-related macular degeneration (AMD) in the following domains:

(i) Psychosocial adaptation, and;
(ii) Vision-related quality of life;

The **secondary objectives** of the proposed study also aim to investigate the potential effectiveness of an expressive arts-based intervention, with reference to a treatment-as-usual, waitlist control group on the followings:

(iii) Symptoms of anxiety and depression;
(iv) Resilience;
(v) Social support;
(vi) Imagination;

While participants' experiences as well as the process of the expressive arts-based intervention on other psychosocial wellness of persons with AMD will also be explored:

(vii) The relationships of the psychosocial variables and intervention effectiveness (e.g. mediation, moderation, and other associations)
(viii) The participants' experiences in the intervention group (through qualitative inquiry), and;
(ix) The factors that may contribute to or affect the intervention outcomes of the expressive arts-based group intervention (through both quantitative and qualitative inquiries).

Background of Research Study

Age-related functional impairments, such as deafness, loss of speech, loss of limbs, dementia, and stroke-related paralysis impose tremendous stress on aging adults; evidence seemed to suggest that vision loss is one of the most prevalent and most-feared disabilities in old age [1, 2], yet limited resources have been invested to help them. Vision loss triggers emotional reactions of extreme loss of confidence, sense of control, and independence in those affected by vision loss [3]. Amongst all, the ***age-related macular degeneration (AMD)*** is the most common cause of age-related, progressive, and irreversible vision loss. AMD occurs when the cells of the macula deteriorate, resulting in loss of central vision. Most people with AMD may be asymptomatic at the early stage of the disease, whereas when the disease progresses, they may experience blurring of central vision, distorted vision, empty spot appears in the centre of the visual field, colors appeared dull or washed out, and eventually become complete loss of central vision. Although the etiology of AMD is unknown, predisposing factors related to the development of AMD include heredity, ageing, smoking, obesity, and the gender of women [1]. As the most common form of vision disease, the prevalence rate of AMD is higher than glaucoma and diabetic retinopathy combined, accounting for 8.7% of all blindness of persons aged 65 or above worldwide. AMD is also the most common among individuals aged 60 or above, and the age of onset could be as early as 40; the prevalence rate of AMD surged from 1% to 15% for persons aged between 55 and 80 [4, 5]. Given the trend of ageing worldwide, the disease and its sequels will increase the burden on society; despite the prevalence and the long duration of this progressive disease, limited interventions exist and there are currently no proven therapies for atrophic disease, a major type of AMD [2]. Most attention and resources have been allocated towards improving everyday functioning; psychosocial wellbeing that is equally important to rehabilitation and successful adaptation to vision loss is secondary and inadequate [6, 7].

Psychosocial Needs of Persons with AMD

Persons with AMD experience significant impairments in key aspects of daily life and require active adaption in response to the deteriorating vision ability and the consequences of the disease [8]. Research of psychosocial needs of adults with AMD is rare in Hong Kong. A qualitative study has been conducted by the project team to explore the psychosocial impacts of AMD in local Chinese adults; it was found that individuals with AMD faced the challenges of transitions of self-identity, psychological distress, as well as obstacles in social relationships and living in the community [9]. It was also documented, when compared with an age-matched cohort with chronic illnesses, persons with AMD experienced profound impairment in their daily life instrumental functions, quality of life, emotional wellbeing, and physical health status [10]. ***Depression*** is a common collateral diagnosis for this population [7]. In addition, literature also suggested that persons with AMD showed elevated signs of ***anxiety*** when compared with normal-vision peers and other adults with chronic diseases [11-13]. Research findings suggested that among persons with AMD, compromised mental health exacerbated difficulties in adjustment [14]. Horowtiz and colleagues suggested that treatment outcomes and life satisfaction were strongly and negatively associated with depressive symptoms [15]. Research also showed that older adults with AMD-related vision loss were correlated with ***diminished social network***, poor sense of self, and decreased perceived autonomy [16]. Adults with vision loss are also at risk of ***poor quality of life*** [17, 18], which resulted from 1) reduced participation in social and vocational activities, 2) sense of hopelessness and depression from vision loss, and 3) the distress related to adjustment trajectory and prognosis of visual loss over time [19]. Even worse, the poor quality of life and risk of developing depression and anxiety elevated the suicide risks in this population, and the risk is greater than

that associated with malignant disease and neurological disorders [20]. Overall, the above research and literature converged on one important point: ***it is crucial to address the psychosocial needs of persons suffering from AMD to support them to achieve optimal treatment benefits, better adjustment and adaptation to their lives to go beyond their vision limitation.***

Help is much needed to prevent a considerable impoverishment of life. Although the primary focus of rehabilitation in vision impairment is to learn ways to complete everyday activities, simply modifying physical performance does not necessarily yield adaptation [21]. Persons with vision loss may need to use different strategies at different times and in different situations to address the many difficulties they encounter. Hence the enhancement of psycho-social flexibility in coping is the key to successful adaptation to vision loss. Persons with vision loss not only need to learn compensatory skills, but also the need to build ***resilience***, renegotiate supportive relations, and maintain bio-psycho-social wellbeing [21]. Furthermore, a cross-sectional study suggested that intrapersonal factors, such as acceptance of loss and perceived ***social support*** played a pivotal role in mitigating depressive symptoms and eliciting adaptive coping among older adults suffering from vision loss [1].

Why Expressive Arts-based Intervention (EXABI)

A scoping review published by the World Health Organization suggesting that arts and arts therapies impact health and wellbeing is not particularly new [22]. Expressive arts-based intervention (EXABI) integrates psychotherapeutic skills with the use of the intrinsic expressive and healing power of arts, and seeks to engage the client holistically across the physical, cognitive, emotional, social, aesthetic, and transpersonal domains [23, 24]. This approach uses different creative arts modalities (arts, dance/ movement, drama, music, and words) in an integrative way as a vehicle for establishing interpersonal connections (verbal or non-verbal), encouraging aesthetic appreciation with a non-judgmental attitude, and cultivating mutual understanding, support and appreciation [24]. EXABI takes a “low-skill high-sensitivity approach”, as such, participants do not have to be proficient in any verbal or non-verbal communication skills or arts ability; they would be facilitated to become sensitive to whatever they are experiencing so that they could engage creatively and meaningfully in different arts media and find way of working with the situation that feels “just right” to them [24]. The use of different elements from EXABI has attracted much attention in community settings due to its safe, engaging, enjoyable process, and its non-pharmacological and strength-based orientation [25]. More importantly, the multimodality nature of EXABI can expand and complement each communication channel (via sound, images, movement and words) through the imaginative and creative power of the arts, creating unlimited possibilities in expression.

A qualitative study on the potential benefits of a dance program for people with visual impairments showed promising physical benefits (such as coordination, balancing, body awareness, and increased physical activity) as well as interpersonal benefits (such as inclusion, friendship, and social support networks) [26]. While a music-based intervention also resulted in positive changes in personal wellbeing, tolerance of impairments, and social communication, at the same time, it helped building inner resources to tackle the challenges posed by vision loss [27]. A multimodal, expressive arts therapy for a senior adult with visual impairment suggested that the intervention has facilitated acceptance of physical weakness and promoted active coping in a residential setting [28]. Thus, the application of expressive arts intervention might facilitate the effective use of residual vision that might help enhance what sight remains, and keep contact with an external world. Moreover, EXABI offers a platform to uncover and express their anxieties by externalizing them onto a neutral object e.g. the paper

or sound, that would allow an individual to stay in the present moment. The non-judgmental environment emphasized during the process can also help participants experience an acceptance of whatever emerges through the art and the art-making process; and that would help preserve the sense of control over one's own life and during adversity, leading to resilience [29]. Furthermore, through exploration in expressive arts intervention, one is more aware and getting in touch with previously unacknowledged feelings or needs; that would help individuals acquire better self-understanding as they face the challenges posited by vision loss.

Theoretical Basis of Expressive Arts-based Intervention for Vision Loss

Rested on the assumption that all art disciplines engage to some extent with sensory and communicative modalities when being created or observed, Roscher proposed the *Polyaesthetic Theory* [24] which has been adopted as the theoretical basis for expressive arts therapy. The theory is also recognized as having the essence of Chinese arts [28, 30] as images and poems always go together in traditional Chinese paintings. The theory asserts that all art modalities embrace a variety of sensory channels and imagination modalities. For instance, engaging visual arts involves not only visual perception, but also sensorirmotor and tactile senses as we paint; musicing does not only rely on auditory sensory modality, but also other forms of senses. Through imagination, one can even add sound and movement to an image. The art-making process allows persons with visual impairment to convey explicit and implicit visual images through non-visual forms, and thus the use of arts can bypass or breakthrough the limitations of communicating through visual cues [31]. The intermodal transfer of art modality from one to the other could help enhance persons with vision loss to perceive and expand their experiences in a multimodal way. Thus, the multimodal expressive arts-based intervention could help tap into different sensory channels for communication, expression, perception and interactions, and satisfy the different preferences of expressive channels that individuals may have, while offering opportunities for them to explore new ways of knowing and interacting with others [32]. Intervention strategies that help to facilitate communication and coping for persons with AMD would help improve quality of life, buffer against psychological complications, instill a sense of control and resilience that is instrumental to active participation in treatment and rehabilitation [8, 33]. On the other hand, such initiatives would help buffer against caregiver stress, prevent caregiving burden, which would in turn further enhance the overall wellness of the individual and the family caregivers [33].

The EXABI emphasizes the process of exploration with arts and imagination, which encourages individuals to try out new strategies to communicate, relate to each other, and in problem-solving. Such exploration and reliance on creativity will allow the individuals more room to express, more flexibility to manage the disabilities and impairments due to vision loss; open new ways that enable adaptive daily functioning [26]; and facilitate the improvements of wellbeing and resilience for persons with vision loss [1, 6]. Expressive arts-based group intervention allows social support to emerge between the group members synergistically, whereas the experiences of one member could provide the avenue for other members to model alternative copings [26, 29]. When participants use arts to share what they normally cannot verbalize, they open up possibilities for unexpected common themes for discussion and exploration [6]. The arts-based group also allows the participants to connect more with the program content, display attention and appreciation of the self, others, and the external environment, rather than only learn practical skills to manage issues arising in daily living [3]. Although evidence is accumulating on the use of arts-based approaches to help individuals with vision loss, ***existing evidence on the use of arts among persons with vision impairments is rather limited*** and is plagued by the following limitations: (i) small sample; (ii) inclusion of participants with various vision loss conditions; (iii) interventions with single art modality; (iv)

without post-intervention data collection time points to explore the sustainability of changes. To address the above limitations and knowledge gaps, this study may generate rigorous research evidence to support the use of expressive arts-based intervention, which puts equal emphasis on creativity, multi-sensory integration, and cultivation of inner coping resources for people with visual impairments.

Work Done by the Team

The current research team comprises experienced and well-known researchers and clinical experts in expressive arts therapy, ophthalmology, optometry, psychiatry, mental health, and outcome research in behavioural health. All of them have works done related to the population, the arts-based intervention, and the health and wellbeing issues related to this study. ***Prof. Rainbow Ho (PI)*** has rich experiences in clinical practice and research (RCT, mixed methods) in expressive arts-based interventions, including its cultural adaptation, mechanism, and psycho-physiological outcomes [34, 35]. She has also supervised trainees in using expressive arts for the wellbeing of persons with different clinical conditions, including visual impairment [28], hearing impairment, depression, dementia, stroke and cancer, etc. ***Dr. Allen Cheong*** is an experienced researcher-practitioner in optometry and rehabilitation for persons with visual impairments. She has collaborated with the PI and the project team in a study on exploring the psychosocial needs of adults with visual impairments [9]. She is collaborating with HKU and HKSB on projects using non-invasive brain stimulation and perceptual learning to improve functional vision in patients with AMD and glaucoma. ***Dr. Adrian Wan*** is a researcher on holistic wellness, mindfulness, expressive arts-based intervention, and social work practices in patients with chronic illnesses and caregiver supports [36, 37]. ***Dr. Qing Li*** is associate consultant in Grantham hospital. The experiences in research and clinical practices of the project team will ensure proper implementation of the project components, its scientific rigor, as well as translation of the research findings to practical wisdom locally and internationally.

Research Plan and Methodology

Study Hypotheses. The proposed study attempts to explore the following hypotheses:

1. The Expressive Arts-based Intervention Group is more effective than the treatment-as-usual waitlist control in (i) psychosocial adaptation, (ii) vision-related quality of life, (iii) anxiety and depressive symptoms, (iv) resilience, (v) social support, and (vi) imagination of persons with AMD.
2. Changes observed/ reported by participants in the expressive arts-based intervention group are sustainable at 3-month and 6-month post-intervention follow-up time points.

Exploratory Questions. The proposed study will also attempt to explore the potential mechanism and process of the interventions:

3. The relationships of the psychosocial variables and intervention effectiveness (e.g. meditation, moderation and other associations)
4. The participant's experiences in the expressive arts-based intervention group.
5. The potential factors and conditions that may affect how and why the expressive arts-based intervention works or does not work for the participants, and real-life application of the experiences that the participants have in the intervention groups.

Study Design and Methods of Data Collection

Study Design. This proposed study adopts a randomized controlled trial with *mixed methods design.* To address the research objectives, data collected will be triangulated and interpreted

simultaneously to address the research questions. **Appendix A** depicts the CONSORT flow diagram of the present study. Outcome measures will be assessed on four time-points (T_0: Pre-intervention at baseline; T_1: Post-intervention; T_2: 3-month post-intervention and; T_3: 6-month post-intervention) to assess the immediate and sustained effects of the expressive arts-based intervention on psychosocial wellbeing of the participants. Qualitative interviews will be conducted with a random subsample of 30 participants from the expressive arts group at T_1 and T_3 to collect fine-grained, information to explore their overall experience of participation in the intervention and how the experience has shaped their coping experience in terms of stress management, self-care challenges, and to reestablish severed social connections. Results of the qualitative interviews will be used to enhance the interpretation and understanding of the quantitative findings [38]. **Appendix B** summarizes the conceptual framework of the study.

Participants. Although the prevalence of AMD is most common at 60 or above, there has been a decreasing trend in the onset age of the disease; individuals aged 50 or above or even younger are at risk of the disease, depending on their exposure to lifestyle-related risk factors [2]. As suggested by the clinical experts in the team, we intend to recruit community-dwelling, Chinese-speaking adults aged between 50 and 80, with diagnosis of age-related macular degeneration in one or both eyes of all different etiologies[39]. Inability to understand the Chinse language, as well as a diagnosis of total blindness, presence of other significant physical, psychological, and cognitive comorbidities that would hinder the participant from completing the study will be excluded.

Recruitment. The recruitment will be facilitated by our collaborative partners in the community (including the Vision Rehabilitation Clinic at The Hong Kong Polytechnic University and The Hong Kong Society of the Blind), and in the hospital (including the Department of Psychiatry of Queen Mary Hospital and the Department of Ophthalmology of Grantham Hospital), as well as referral from medical and mental health professionals working in the field of geriatric, psychiatry, clinical psychology, social work, and other related fields. Promotion will be arranged on the website/social media platform of the Department of Social Work and Social Administration and Centre on Behavioural Health, HKU, the Optometry Clinic at PolyU, Department of Psychiatry of Queen Mary Hospital, and the Department of Ophthalmology of Grantham Hospital. Screening will be conducted by the researcher or referral professionals who have attended briefing sessions offered by the research team. In view of their visual conditions, computer-assisted methods and research assistant(s) will be available to assist data collection by face to face/phone follow up. To encourage participation in the multi time-points study, incentives in forms of cash vouchers will be given to participants of both the experimental group and the control group. Each of participants will be given a case voucher of HKD$50 at each data collection time point.

Sample Size: We expect a moderate effect size of 0.5 for the primary outcomes based on previous studies on expressive arts intervention [40]. Power analysis was conducted using the Gpower 3.1 software. Assuming a 20% attrition rate, a total sample of 154 participants with 77 participants for each arm will offer a statistical power of 80% to detect the moderate effect size in the 2-arm RCT with 4 measurement time points at a significance level of 0.05. For the qualitative data, a random subsample of 25 - 30 from the intervention arm will be invited to join individual and in-depth interviews at post-intervention (T_1) and 6-month follow-up (T_3). Based on the guidelines for mixed-methods study design, a sample of 25 participants should suffice data saturation. More participants will be recruited into the study if data saturation is not reached until no new findings emerge [41].

Group Allocation. Eligible participants will be randomly assigned into one of the two study conditions on a 1:1 basis using a randomization table and a computer-assisted random number

generator. The allocation list will be produced by an independent researcher and concealed from other researchers and participants until assignment.

(a) *The Expressive Arts-based Group Intervention:* The 8-session intervention group (weekly session, 90 minutes each, with 6-8 participants in 1 group) will be delivered by a registered Expressive Arts Therapist, or a therapist trainee/ mental health professional trained supervised by a qualified expressive arts therapist or the PI. Each session is structured based on the basic architecture of Intermodal Expressive Arts Therapy composing of the basic processes in EXAT: check-in, warm-up, core arts-making, sharing, and closure [30, 42]; and focuses on a specific theme related to the psychosocial needs of persons with AMD: communication, expression, flexibility, relationship, coping with uncertainties, confidence, creativity, and resilience. A similar program has been adopted for people with deteriorating chronic illness [40, 43, 44], and has been refined to integrate the cultural-relevant components (e.g. Chinese festivals, Chinese arts and music, etc.) [2, 3], and used by the team in previous studies, student practicums and community workshops [45, 46] and fine adjustment has been made to suit people with visual adjustment [28]. **Appendix C** summarizes the structure of the session.

(b) *The Wait-list Control Group*: This study aims to show whether people benefit from receiving the EXABI as a treatment package compared with those who are not receiving it, i.e. the absolute effect of the intervention [47], thus a waitlist control group that continues with usual routine healthcare (e.g. existing functional, rehabilitation services, etc.) will be adopted. The controls will be invited to attend the expressive arts-based group intervention upon completion of the study period.

Treatment fidelity. Group facilitators of the program will receive training on the protocol and safety precautions. Treatment fidelity will be assessed by the PI in the form of on-site or video-reviewing supervisions during the 2nd or 3rd session upon informed consent in Chinese by the participants; and off-site supervision to support the facilitators. Assessment will be conducted using a pre-constructed observation checklist of program pedagogy and expected goals.

Research ethics. Ethical approval will be obtained from the Institutional Review Board and Human Research Ethics Committee prior to data collection, and consent in Chinese will be obtained from all recruited participants prior to assessment. The study will be registered in the HKU Clinical Trials Registry and the ClinicalTrials.gov under the National Institutes of Health. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Measurements

Primary Outcomes

1. *Psychosocial Adaptation Scale for Visual Impairments.* The 38-item Psychosocial Adaptation Questionnaire (PSAQ) for visual impairment in Chinese [48] is a self-report measure of visual impairment-related psychosocial adaptation. It is rated on a 4-point Likert Scale, and yields 7 domains of attitude, self-acceptance, self-esteem, anxiety/ depression, sense of belonging, self-efficacy, and self-control. Higher scores indicate a higher level of endorsement in specific domain.
2. *Quality of life.* Vision-specific quality of life is measured by the 13-item Vision-Related Quality of Life Scale in Chinese taken from NEI-VFQ-25. The scale measures vision-related social function, as well as mental health symptoms, role limitations, ocular pain, and dependency on others due to vision impairment, using on a continuous scale ranging from 0 to 100, with higher score indicates the best possible outcome. The scale has been adopted to

assess vision-specific quality of life among Chinese adults with visual impairments [49].

Secondary Outcomes

3. *Symptoms of depression and anxiety.* To better assess the severity of depressive symptoms and anxiety, the 14-item Hospital Anxiety and Depression Scale in Chinese will be used to measure anxiety and depressive symptoms, with higher scores indicated higher level of anxiety and depressive symptoms perceived by the participants [50].
4. *Resilience.* The Chinese version, 14-item, self-report Resilience Scale-14 (RS-14 is a reliable and valid instrument of resilience of Chinse; it measures resilience on a 7-point Likert Scale, with higher scores indicate higher levels of resilience [51] .
5. *Social support.* Perceived social support is captured by the Chinese version of the Multidimensional Scale of Perceived Social Support [52]. The 12-item scale composes of subscales for perceived social support from the family, friends, and significant others, rated on a 7-point Likert scale. Higher score denotes a higher level of support in specific domain.
6. *Imagination.* The 25-item Self-Descriptive Imagination Questionnaire (SIQ) [53] with five factors: expressive imagination, openness to variations, instrumental imagination, past/future mindedness, and conventionality, and 21-item Fantastic Reality Ability Measurement (FRAME) [54] with four features: coping, transcendence, playfulness, and control. These two scales in Chinese will be used to measure participants' imagination.
7. *Demographics.* Participant profiles including age, gender, education level, income, employment status, religiosity, marital status, and family composition will be recorded. Clinical information (time since onset/ diagnosis, vision status, medical treatment record, psychiatric history, comorbidity (physical disabilities, hypertension, diabetes mellitus, or other cognitive disturbance) and rehabilitation services utilization will be documented in Chinese. The vision status of the participants will be documented by the 15-item Functional Vision Screening Questionnaire (FVSQ) [55].

In-depth Interviews: About 25-30 participants in the intervention group will be invited to attend two individual in-depth interviews in Chinese at post-intervention (T_1) and 6-month follow-up (T_3). The first interview focuses on the immediate post-intervention changes perceived by the participants upon program completion, while the second interview focuses on the sustainability of these changes at 6-month follow-up and explores additional changes that would be observed between the follow-up windows. The interviews will be conducted by members of the research team, assisted by a research assistant, using an interview guide (see **Appendix D**) [56, 57].

Data Analysis: Analyses of the outcomes will be conducted according to the standard intent-to-treat principle to address the effects of crossover and attrition. The emerging themes from the qualitative analysis will be reviewed for resonance with the quantitative findings, and triangulated to identify the potential pathways for the therapeutic effect of the intervention.

1. *Effectiveness of the expressive arts-based intervention group (Hypothesis 1 – 2).* Descriptive statistics will be used to summarize the socio-demographic profiles of the participants at the baseline upon recruitment. Chi-square tests and independent t-tests will be performed to examine whether there are significant differences in the demographic factors and baseline outcomes between groups. The primary analysis of treatment outcomes will be conducted using mixed-effects regression models using Mplus 8.3. Mixed-effects models analyze the repeated measurements between groups to obtain the group x time effect as the intervention effect. Missing data in the sample will be handled using full information maximum likelihood method [58] according to the intention-to-treat principle. Effect size of the intervention will be evaluated using Cohen d [59], with 0.2, 0.5, and 0.8

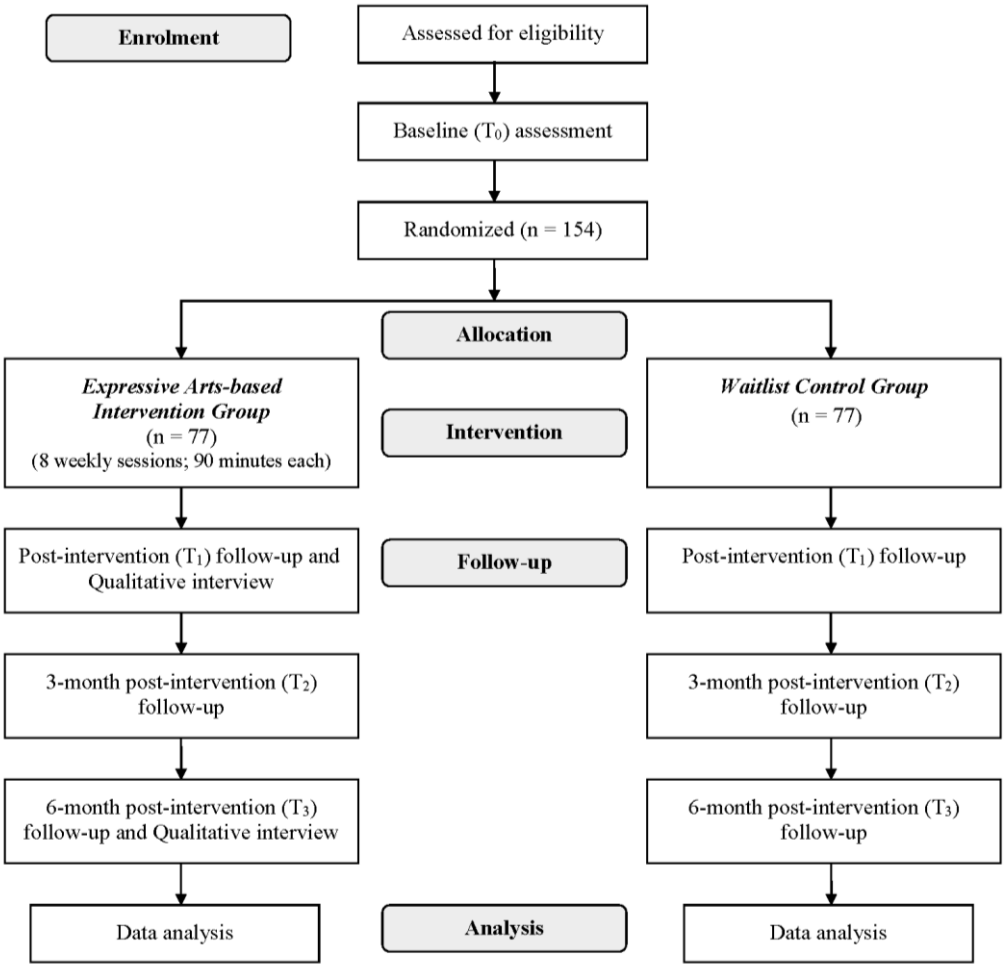
denoting cut-off of small, moderate, and large magnitudes respectively. Demographic and clinical variables will be controlled in the analysis. Statistical significance is set at 0.05.

2. *Process and mechanism of the treatment group (Exploratory research question 3).* Correlation analysis will be conducted to explore the relationships between the primary and secondary measures, and other demogrphics and clinical variables. Path modeling will be performed to examine the mediating role of adaptive functioning and social support on the effect of EXAT on quality of life, emotional distress, and overall health condition. The path model will be built for the EXAT intervention group as the predictor variable at baseline (T_0). Mediation effects will be assessed through the significance of the indirect effects from EXAT to outcome variables (quality of life, and emotional distress) at T_3 via the mediators (adaptive functioning and social support) at post-intervention (T_1) and 3-month follow-up (T_2). Given the likely non-normal distribution of the indirect effects, confidence intervals will be estimated using the bootstrapping approach. Themes related to processes and factors related to changes will be identified from the qualitative analysis to supplement and explain the quantitative findings. Although a sample size of 150 – 200 is normally recommended for conducting path analysis in the form of structural equation modeling (Kline, 2005). Our team has successfully conducted path analysis on data of previous projects with smaller sample sizes (N = 121–151) and published several papers in international journals [60-62]. Potential moderating effects would be explored by examining the interaction effects between the EXABI treatment and demographic factors such as gender and clinical factors such as clinical classification of AMD on the outcome variables.
3. *Process and experience of the treatment (Exploratory research question 4-5)*. Qualitative data from the open-ended questionnaires will be converted into electronic text file for data analysis. The interviews will be audio-taped, and transcriptions will be produced by a research staff who is not involved in the interventions. All data will be input, managed, and analysed using NVivo 12.0 or above. Analysis will be performed using inductive thematic analysis method. Transcripts will be coded, and the codes will be put into categories and subcategories; and recurrent themes and patterns will be explored. A team member who is experienced in qualitative data analysis will conduct the analysis. Audit trial will be conducted to ensure data credibility; while the trustworthiness of the analysis will be ensured through member checks, triangulation and interrater reliability (helped by another research staff). The qualitative analysis will identify themes related to processes and factors related to changes to supplement and explain the quantitative findings.

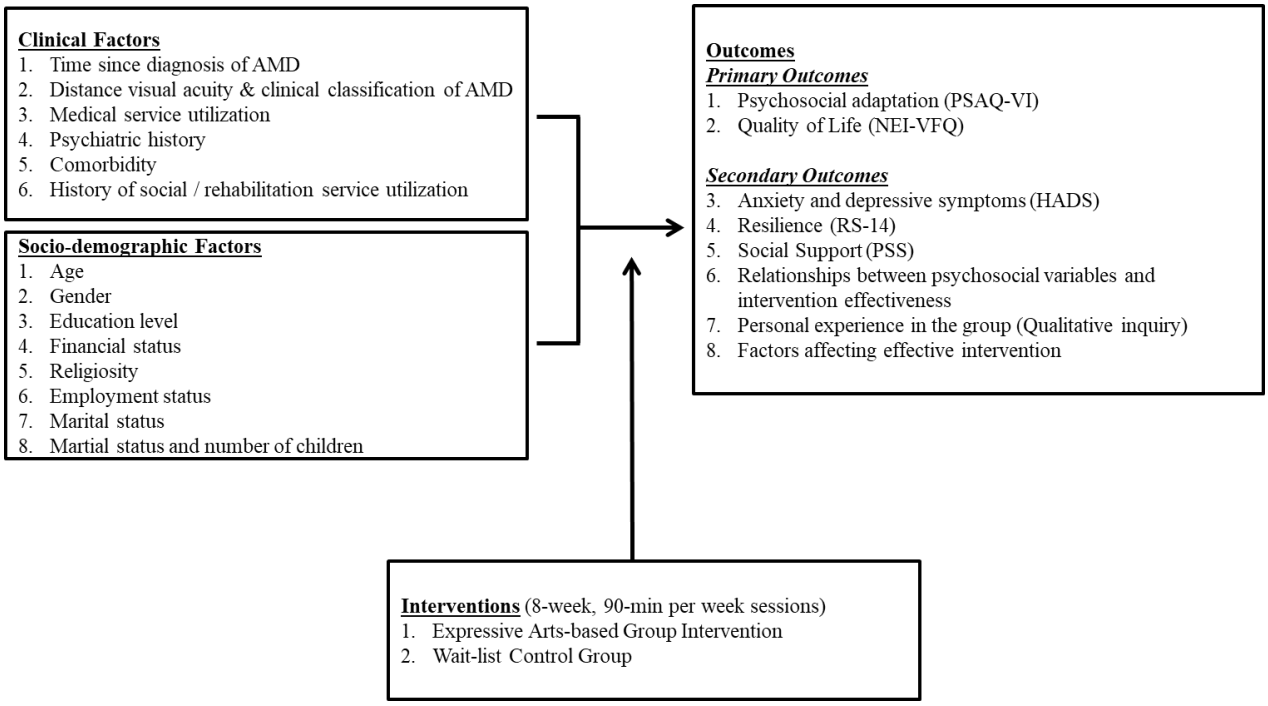
Gantt Chart (Study Period: 3 years)

	2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Literature review and refinement of research protocol												
Preparation and Liaison with collaborators												
Recruitment, screening and randomization												
Baseline (T_0) assessment												
Expressive Arts-based Intervention Group (8 weeks)												
Post-intervention (T_1) follow-up and interview												
3-month post-intervention (T_2) follow-up												
6-month post-intervention (T_3) follow-up and interview												
Data cleaning and analysis												
Report writing												

Appendix A: CONSORT diagram for the proposed study



Appendix B: Conceptual Framework of the proposed study



Appendix C: Sessions Outline & Structure of an Expressive Arts-Based Intervention Group Session (EXABI) [30]

Themes of Expressive Arts-based Intervention Program for Visual Impairment

The program structure follows the architecture of Intermodal Expressive Arts Therapy (Knill, Levine and Leving, 2005)

Session 1	Communication: through arts and imagination
Session 2	Expression: playful and de-stress expression
Session 3	Flexibility: finding alternatives
Session 4	Relationship: relating to others in a meaningful way
Session 5	Coping with uncertainties
Session 6	Confidence: adapting to change
Session 7	Creativity: going beyond the limits
Session 8	Resilience: regaining the balance in life

A Typical Session (90 mins)

	Time	Process	Purposes
Filling-in: Greetings and check-in	10 mins	• Greet with verbal or non-verbal means i.e. gestures, voice etc. • Give a summary of previous session starting from the 2nd session • Introduce the theme of the session	• Transit from the real world to the therapeutic space. • Establish relationship and rapport • Connect the present session with the previous session(s) • Provide an idea of the focus of the session
Bridging: Warm Up	10 mins	• Use musical rhythm or simple movement games and props to interact with each other • Introduce the theme in more details for art creation using sound, movement, or imagination.	• Warm-up physically and psychologically • Identify the atmosphere and status of the group and make appropriate fine adjustments to the session if it is needed • Prepare for the arts-making process
Decentering: Arts making and appreciation	35 mins	• Create artworks together or individually, based on different themes of the session (see above) • Share the artworks in pairs and/or with the group • Appreciate and response to each other's artworks through verbal/nonverbal means	• Facilitate creative expression and positive interactions between group members • Encourage imagination and creativity • Foster mutual support and relationship in the group
Harvesting: Sharing and response	25 mins	• Facilitate further sharing and discussion by the therapist • Help participants consolidate the experience/discovery from the process	• Consolidate the experiences and create articulation to their situations and daily lives
Closure	10 mins	• Create gestures or sounds, with or without verbal language, to say thank you and goodbye to the group	• Closing the session • Transit to the real world

Appendix D: Interview Guide for Qualitative Interview

Questions	Potential probes
1. What was your experience like about the 6-week Expressive Arts-based Group Intervention?	Acceptability of the program Satisfaction towards the program
2. Could you please share with me **your mood or general emotional experiences** after the program?	Mood and emotional wellbeing Experience of positive and negative emotions
3. Could you please share with me your perceived **coping repertoire/ coping ability** after the program?	Perception of problem-solving ability, and coping repertoire as perceived by the participants
4. Could you please share with me your **interpersonal relationships with others** after the program?	Relationship with caregivers/ family members Relationship with friends, colleagues, and others
5. Could you please share with me (if any) those i) **insight moments**, ii) **experiences that surprised you** , and/ or iii) **"take home messages"** that you have acquired from the program?	Underlying reasons, process, experiences that are attributable to the changes. The personal process of embodiment, concretization, and the use of metaphors and symbolism in the intervention group.
6. What kind of learning you can bring forward into your real-life situations?	How the participants apply and generalize the learning from the session setting into real life situations.

1. Tolman, J., et al., *Psychosocial adaptation to visual impairment and its relationship to depressive affect in older adults with age-related macular degeneration.* The Gerontologist, 2005. **45**(6): p. 747-753.
2. Wong, W.L., et al., *Global prevalence of age-related macular degeneration and disease burden project for 2020 and 2040: A systematic review and meta-analysis.* The Lancent, 2014. **2**: p. e106-16.
3. Szubielska, M., *People with sight impairment in the world of visual arts: does it make any sense?* Disability & Society, 2018. **33**(9): p. 1533-1538.
4. Health, D.o. *Age-related macular degeneratioin*. 2020 7 Feburary 2020 [cited 2021 30 September]; Available from: https://www.elderly.gov.hk/english/common_health_problems/others/amd_factsheet.html.
5. You, Q.S., et al., *Prevalence and causes of visual impairment and blindness among adult Chinese in Hong Kong - The Hong Kong Eye Study.* Ophthalmic Epidemiology, 2020. **27**(5).
6. Van Der Aa, H.P., et al., *Psychosocial interventions to improve mental health in adults with vision impairment: systematic review and meta-analysis.* Ophthalmic and Physiological Optics, 2016. **36**(5): p. 584-606.
7. Demmin, D.L. and S.M. Silverstein, *Visual impairment and mental health: unmet needs and treatment options.* Clinical Ophthalmology 2020. **14**: p. 4229-4251.
8. Ueda, Y., *Psychosocial adaptation to visual impairment.* Causes and coping with visual impairment and blindness, 2018: p. 93-108.
9. Ho, R.T.H., et al., *Living with low vision: Perspectives of patients with retinal degenerative disease in Hong Kong*, in *Society of Behavioral Medicine 43rd Annual Meeting & Scientific Sessions*. manuscript in progress: Baltimore, MD.
10. Williams, R.A., et al., *The psychosocial impact of macular degeneration.* Archives of ophthalmology, 1998. **116**(4): p. 514-520.
11. Augustine, A., J.-A. Sahel, and F. Bandello, *Anxiety and depression prevalnce rates in age-realted macular degeneration.* Invest Opthalmol Visual Sci, 2007. **48**(4): p. 1498.
12. Eramudugolla, R., J. Wood, and K.J. Anstey, *Co-morbidity of depression and anxiety in common age-related eye diseases; A population-based study of 662 adults.* Aging Neuroscience, 2013. **5**.
13. Kempen, G.I.J.M., et al., *Erratum to: The impact of low vision on activities of daily living, symptoms of depression, feelings of anxiety and social support in community-living older adults seeking vision rehabilitation services.* Quality of Life Research, 2012. **21**(8): p. 1413.
14. Rovner, B.W. and R.J. Casten, *Neuroticism predicts depression and disability in age-realted macular degeneration.* American Journal of Geriatric Psychiatry, 2001. **10**: p. 305-310.

15. Horowitz, A., R. Leonard, and J.P. Reinhardt, *Measuring psychosocial and functional outcomes of a group model of vision rehabilitation services for older adults.* Journal of Visual Impairment and Blindness, 2000. **94**: p. 30-41.
16. Cherry, K.E., M.J. Keller, and W.N. Dudley, *A needs assessment of persons with visual impairments: Implication for older adults and service providers.* Journal of Gerontological Social Work, 1991. **17**: p. 99-123.
17. Boerner, K., S. Wang, and V.R. Cimaroli, *The impact of functional loss: Nature and implications of life changes.* Journal on Loss and Trauma, 2006. **11**: p. 265-287.
18. Vu, H.T.V., J.E. Keeffe, and C.A. McCarty, *Impact of unilateral and bilaterial vision loss on quality of life.* British Journal of Ophthalmology, 2005. **89**: p. 360-363.
19. Lau, J.T.F., *The Hong Kong Adult Vision Study: a cross-sectional epidemiological pilot study of eye diseases in the population aged 40 years and over in Hong Kong.* Hong Kong Med J, 2007. **13**: p. S4-6.
20. Cosh, S., et al., *Sensory loss and suicide ideation in older adults: Findings from the Three-City cohort study.* International Psychogeriatrics, 2019. **31**(1): p. 139-145.
21. Smith, T.M., *Adaptation to low vision caused by age-related macular degeneration: a case study.* Journal of Visual Impairment & Blindness, 2008. **102**(11): p. 725-730.
22. Fancourt, D. and S. Finn, *Health Evidence Network Synthesis Report 67: What Is the Evidence of the Role of the Arts in Improving Health and Well-being?* 2019, World Health Organization: Copenhagen, Denmark.
23. Roger, N., *The Creative Connection for Groups: Person-centered expressive arts for healing and social change*. 2011, Palo Alto, California: Science & Behavior Books.
24. Knill, P.J., *Foundations for a theory of practice*, in *Principles and practice of expressive arts therapy: Towards a therapeutic aesthetics*, P.J. Knill, E.G. Levine, and S.K. Levine, Editors. 2005, Jessica Kingsley Publishers: London.
25. Mossey, J.M., et al., *Effectiveness of a psychosocial intervention, interpersonal counseling, for subdysthymic depression in medically ill elderly.* Journal of Gerontology, 1996. **51A**(4): p. M172-M178.
26. Seham, J. and A.J. Yeo, *Extending our vision: access to inclusive dance education for people with visual impairment.* Journal of Dance Education, 2015. **15**(3): p. 91-99.
27. Park, H.Y., *The Meaning of Musicing in the Post-traumatic Growth of Individuals With Adventitious Visual Impairment: Applying the Life History Method by Mandelbaum.* Frontiers in Psychology, 2021. **12**.
28. Cheung, I.P.Y., *Expressive Arts Therapy (EXAT) with a Visually Impaired Female Senior Adult*, in *Department of Social Work and Social Adminsitration*. 2019, The University of Hong Kong: Hong Kong. p. 63.
29. DiGiulio, D., *The use of art therapy with the blind to impact a sense of capability*, in *Art Therapy Department* 2017, Long Island University.

30. Levine, E., P. Knill, and S. Levine, *Principles and Practice of Expressive Arts Therapy: Toward a Therapeutic Aesthetics.* . 2004, London: Jessica Kingsley Publishers.
31. Cho, J.D., *A Study of Multi-Sensory Experience and Color Recognition in Visual Arts Appreciation of People with Visual Impairment.* Electronics, 2021. **10**(4): p. 470.
32. Got, I.L.S. and S.T. Cheng, *The effects of art facilitation on the social functioning of people with developmental disability.* Art Therapy: Journal of the American Art Therapy Association, 2008. **25**(1): p. 32-37.
33. Dev, M.K., et al., *Psycho-social impact of visual impairment on health-related quality of life among nursing home residents.* BMC health services research, 2014. **14**(1): p. 1-7.
34. Ho, R.T.H., et al., *Pssychophysiological effects of Dance Movement Therapy and physical exercise on older adults with mild dementia: A randomized controlled trial.* Journal of Gerontology: Psychological Sciences, 2020. **75**(3): p. 560-570.
35. de Witte, M., et al., *From therapeutic factrs to mechanisms of change in creative arts therapies: A scoping review.* Frontiers in Psychology, 2021. **12**(678397).
36. Ho, R.T.H., et al., *The "Playful" path to parent-child wellbeing: A randomized-controlled study of a creative arts-based group*, in *40th Annual Meeting & Scientific Sessions*. 2019, Society of Behavioral Medicine: Washington, DC. p. S725-725.
37. Wan, A.H.Y., et al., *Factors associating with caregiver identity within the family dyads: A cross-sectional study of Chinese cancer caregiving spouse*, in *Annual Mental Health Conference*. 2013: Hong Kong.
38. Ivankova, N.V., J.W. Creswell, and S.L. Stick, *Using mixed-methods sequential explanatory desgin: From theory to practice.* Field Methods, 2006. **18**: p. 3-20.
39. Organization, W.H., *International Classification of Impairments, Disabilities, and Handicaps: A Manual of Classification Relating to the Consequences of Disease*. 1980: Geneva.
40. Ho, R.T.H., et al., *Effects of Expressive Arts-based Interventions on Adults with Intellectual Disabilites: A Stratified Randomized Controlled Trial.* Froniters in Psychology, 2020. **11**: p. 1286.
41. Saunders, B., J. Sim, and T. Kingstone, *Saturatio in qualitative research: Exploring its conceptualization and operationalization.* Quality & Quantity, 2018. **52**: p. 1893-1907.
42. Cassidy, S., S. Turnbull, and A. Gumley, *Exploring core processes facilitating therapeutic change in dramatherapy: a grounded theory analysis of published case studies.* Arts Psychotherapy, 2014. **41**: p. 351-365.
43. Li, I.M.Y., *The effectiveness of an Attachment-based Expressive Arts Therapy Parenting Programme for Parents with Special Needs Children (Unpublished Thesis)*. 2017, The University of Hong Kong: Hong Kong.

44. Ho, R.T.H. and C.C. Wong, *Joint Painting for understanding the development of emotional regulation and adjustment between mother and son in expressive arts therapy*, in *Arts-based Research, Resilience and Well-being Acoss the Lifespan*, L. McKay, et al., Editors. 2020, Palgrave Macmillan: Switzerland. p. 127-146.
45. Kong, C.K.W., *A case study on the positive effects of Expressive Arts Therapy with Mindful Self-Compassion Intervention for a Mother of Pre-School Child with Developmental Difficulties (Unpublished Thesis)*. 2018, The University of Hong Kong: Hong Kong.
46. Ho, R.T.H. and C.K.P. Chan, *Expresssive Arts Therapy Program for Parent-Child Relationship*. 2018, Yan Chai Fong Kong Fai Kindergarten: Hong Kong.
47. Karlsson, P. and A. Bergmark, *Compared with what? An analysis of control-group types in Cochrane and Campbell reviews of psychosocial treatment efficacy with substance use disorders.* Addiction: Methods and Techniques, 2014. **110**: p. 420-428.
48. Zhang, X.J. and A.P. Wang, *Development of a psychosocial adptation questionnaire for Chinese patients with visual impairments.* Journal of Clinical Nursing, 2011. **20**: p. 2822-2829.
49. Wang, C.W. and C.L.W. Chan, *Psychosopcial adaptation status and health-realted quality of life among older Chinsee adults with visual disorders.* Quality of Life Research, 2009. **18**: p. 847-851.
50. Leung, C.W., et al., *Validation of the Chinese-Cantonese version of the Hospital Anxiety and Depression Scale and comparison with the Hamilton Rating Scale of Depression.* Acta Psychiatr Scand, 1999. **100**(6): p. 456-461.
51. Chung, J.O.K., et al., *Psychometric evaluation of the traditional Chinese version of the resilience Scale-14 and assessment of resilience in Hong Kong adolescents.* Health Qual Life Outcomes, 2020. **18**(33).
52. Zimet, G.D., et al., *The Multidimensional Scale of Percevied Social Support.* Journal of Personality Assessment, 1988. **52**: p. 30-41.
53. Feng, Z., et al., *A cross-cultural exploration of imagination as a process-based concept.* Imagination, Cognition and Personality, 2017. **37**(1): p. 69-94.
54. Rubinstein, D., et al., *Development and validation of fantastic reality ability measurement (FRAME) to measure use of imagination in response to stress and trauma.* Journal of Creativity in Mental Health, 2021. **16**(4): p. 412-427.
55. Horowitz A, Teresi J, Cassels LA. Development of a vision screening questionnaire for older people. J Gerontol Soc Work 2021;17:37-56. doi:10.1300/J083v17n03_04
56. Elliot, R. *Client Change Interview protocol*. 2001 [cited 2020 5 October]; Available from: http://experiential-researchers.org/instruments/elliott/change.html.
57. Sou, C.S.W., *The effects of expressive arts therapy on parent of children with special education needs (Unpublished Thesis)*. 2020, The University of Hong Kong: Hong Kong.

58. Enders, C.K. and D.L. Bandalos, *The relative performance of full information maximum likelihood estimation for missing data in structural equation models.* Structural Equation Modeling, 2001. **8**(3): p. 430-457.
59. Cohen, J., *Statistical power analysis for the behavioral sciences*. 2nd ed. 1988, Hillsdale, NJ: Lawrence Erlbaum Associates.
60. Fong, T.C.T. and R.T.H. Ho, *Mindfulness facets predict quality of life and sleep disturbance via physical and emotional distresses in Chinese cancer patients: A moderated mediation analysis.* Psycho-Oncology, 2020. **29**(5): p. 894-901.
61. Fong, T.C.T., et al., *Psychiatric symptoms mediate the effects of neurological soft signs on functional outcomes in patients with chronic schizophrenia: A longitudinal path-analytic study.* Psychiatry Research, 2017. **249**: p. 152-158
62. Ho, R.T.H., T.C.T. Fong, and P.S.F. Yip, *Perceived stress moderates the effects of a randomized trial of dance movement therapy on diurnal cortisol slopes in breast cancer patients.* Psychoneuroendocrinology, 2018. **87**: p. 119-126.