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# A Systematic Review of the Influence of Anorexic Voice on the Recovery of Anorexia Nervosa

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## Abstract

**Background:** Anorexia Nervosa (AN) causes increased mortality, and high readmissions or relapse rates indicate a lack of psychological focus on current AN intervention. Pugh and Waller thematically analyzed the high frequency of inner-voice disorders prevalent in the AN population, similar to voice hallucinations in other psychological disorders. These patients remained stigmatized and non-disclosed due to correlations with schizophrenia. This review concluded with a detailed understanding of AV that can inform more effective therapeutic interventions and support systems aiding AN and AV's recovery process.

**Methods:** Ten studies (one cross-sectional, one systematic review, five qualitative, and three mixed methods) are included. The methodology quality and bias risk assessments employed a selective appraisal tool.

**Results:** The thematic analysis revealed 'not one size fits all' and non-generalizable Anorexic Voice (AV) for different AN cases. The subjective study of fluctuating AV throughout the progression of AN aimed to comprehensively understand the transition of the inner voice with the illness. The dissociation of AV in the AN patient significantly assures recovery.

**Conclusion:** This review underscored the potential for improved recovery outcomes through a deeper understanding of the relationship of AV with patients and the potential of AV-inclusive therapies. The analysis supports the development of a novel psychological therapeutic framework that includes AV, which can enhance motivation, hope, support, and empathy. However, the review also cautions that an AV standardized framework for unidentified AVs in AN patients may inadvertently trigger or worsen illness.

**Keywords:** Anorexia nervosa • Anorexic voice • Eating disorders • Eating attitudes • Psychological disorders

**Abbreviations:** AN: Anorexia Nervosa; AV: Anorexic Voice; ED: Eating Disorders; EDV: Eating Disorder Voice; BN: Bulimia Nervosa; EDNOS: Eating Disorder Not Otherwise Specified; DSM: Diagnostic and Statistical Manual; BED: Binge-Eating Disorder; OSFED: Other Specified Feeding and Eating Disorders; ARFID: Avoidant or Restrictive Food Intake Disorder; UFED: Unspecified Feeding or Eating Disorder; ON: Orthorexia Nervosa; ICD: International Classification of Diseases; ANR: Anorexia Restrictive; ANBP: Anorexia Binge-purging; QoL: Quality of Life; UK: United Kingdom; BMI: Body Mass Index; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta Analyses; PPI: Patients, and Public Involvement; SWiM: Systematic review Without Meta-analysis; PEO: Population, Exposure, and Outcome; SPIDER: Sample, Phenomenon of Interest, Design, Evaluation, and Research type; ND: No-Date; AHRQ: Agency for Healthcare Research and Quality; MMAT: Mixed Methods Appraisal Tool; CASP: Critical Appraisal Skills Program; AMSTAR: A Measurement Tool to Assess systematic Review; ROBIS: Risk Of Bias In systematic Reviews; RoB: Risk Of Bias; ENTREQ: Enhancing Transparency in Reporting the synthesis of Qualitative research; EAVE-Q: Experience of an Anorexic Voice; EFT-AV: Emotion Focused Therapy; NG: Not Given; SCED: Single-Case Experimental Design; G1: Group 1; G2: Group 2; SD: Standard Deviation; NS: Not Specified; QSR: Qualitative Research; M: Mean; FBT: Family Based Therapy; IPA: Interpretative Phenomenological Analysis; HCPs: Healthcare Professionals

## Introduction

Eating Disorders (EDs) are prevalent among individuals seeking control over food, leading to psychological, social, and physiological distress. According to the Diagnostic and Statistical Manual of mental disorders, fifth edition (DSM-5) EDs are classified into eight sub-categories [1]. Binge Eating Disorder (BED) is three times more common than Bulimia Nervosa (BN) and Anorexia Nervosa (AN) [2]. BN has the highest prevalence of co-morbidities, while AN is the most fatal [3]. Overall, 60% of ED mortality is due to suicide, malnutrition, organ failure, or cardiac arrest, while 25% relapse rates are expected within 60% of recovered EDs [3-5]. Despite the rising incidence of EDs, research funding in the UK for EDs remains low, accounting for only 0.4% of all mental health disorder funding [6].

Anorexia Nervosa (AN), which is the 'deadliest psychiatric disorder' and the inconsistent nature of the illness, emphasizes that every new insight will eventually lead to novel interventions or an improved version of existing interventions. A review of AN interventions yielded 11 published and 24 registered yet unpublished trials [6]. A decrease in treatment-supported coping mechanisms estimated at 30% of relapse rates mostly within the first year after discharge, and risk prevailed for 2 years, as witnessed in a meta-analysis [7].

The denial or underreporting of Auditory-Verbal Hallucinations (AVH) in AN patients was shown to be associated with schizophrenic symptoms, psychological distress and psychotic comorbidities [8-10]. The AVH is also common in the psychologically healthy population [10]. At the onset of AN, the majority of cases described AVs as friends who guided self-improvement and later turned into malevolent or abusive boyfriends [11-13]. The benefit of having a positive relationship with AV was considered a recovery-assisting feature until people showed AV dissociation reluctance due to "companionship reliance" on their voice [10,14,15]. At the malevolent stage, individuals indulge in frequent intense exercise, binge-eating, or purging compensatory behaviour [16].

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Understanding Anorexic Voices (AVs) is important for enhancing therapeutic outcomes in Anorexia Nervosa (AN). Dissociating AVs from the self allows patients to view these voices as separate entities, which can empower them to seek support with a higher likelihood of recovery [17,18]. Traditional, one-dimensional therapies often left patients feeling misunderstood and unheard [19]. In contrast, approaches that externalize AVs as foreign agents have demonstrated increased therapeutic success by shifting the illness from the self to an external entity, thus facilitating more effective treatment [16]. Although inconsistent AVs can create abusive internal relationships and high resistance to AV dissociation [15,20], externalizing these voices and fostering patient acceptance can significantly improve recovery prospects [11,21]. This approach represents a promising advancement in tailoring therapy to address the complexities of AVs in AN.

The auditory voices observed in Anorexia Nervosa (AN) and Bulimia Nervosa (BN) are often characterized by monologic or dialogic second-person commentary [22]. Approximately 94.5% of individuals with these disorders report hearing voices [10]. Despite this, internal dialogue controlled by working memory in anorexic patients shows no impairment in auditory or verbal performance [22]. Aya et al., found that compassionate and empathic Anorexic Voices (AVs) could reduce negative weight concerns, and befriending AVs at this stage may lead to increased acceptance, reliance, and reluctance to leave AN [10]. However, when AV demands are unmet, individuals may shift from perceiving the AV as a friend to viewing it as an enemy, highlighting a positive association between AV power and negative eating pathology. This shift illustrates the complex cognitive model of auditory hallucinations in AN, which reflects both supportive and challenging aspects of AVs in the context of severe eating disorders.

The increase in mortality, complex etiology, and process of recovering AN patients improved the understanding of AV and therapeutic transformations [16,23]. A comprehensive analysis of inner voices indicated a clear shift in relations between individuals and voices [10].

Drawing from the voice dialogue literature, the progression of the AV from supportive to hostile reflects the concept of the "Killer Critic", where the internal critic becomes increasingly dominant, disdainful, and harmful. This shift may lead to decreased or ambivalent motivation for recovery, as well as increased interpersonal mistrust, avoidance, and social isolation [24-31]. Engaging with the AV through voice dialogue and confrontational therapy has improved the understanding of obstacles that hinder the effectiveness of treatments. By addressing the AV as an external entity, these therapies help patients become more aware of its negative influence, which can lead to more successful interventions and reduced relapse rates. This therapeutic approach underscores the importance of directly tackling the AV to enhance treatment outcomes in individuals with AN.

This systematic review aims to answer key research questions regarding the recognition, denial, and influence of AV in individuals with diagnosed AN. By analyzing a comprehensive range of mixed-method research studies, this review has clearly defined objectives to understand the complex relationship between AV, and AN and how AV affects self-perception, treatment engagement, and recovery process.

# Materials and Methods

## Ethical consent

The secondary data were collected and analyzed from the included studies. The study does not involve human participants, which removes anonymity and confidentiality concerns.

## Selection process

The limited evidence and high heterogeneity on AV led to sifting AVs from full-content assessed from qualitative, quantitative, and mixed-method studies for thematic analysis. This mixed-method systematic review included all available research methods for broader contextualization of the data collection and generalizability of the findings [32].

The protocol for this review follows a 17-item PRISMA checklist for systematic review guidelines [33,34]. The Systematic review Without Meta-analysis (SWiM) guidelines assist in reporting quantitative data without meta-analysis [34]. The SwiM guidelines emphasize grouping quantitative data from mixed method research facilitating comparison, justifying the synthesis methods used, highlighting main findings, and addressing variability and bias. An inductive thematic analysis with a logic model framework was applied for qualitative synthesis. Due to significant heterogeneity among research methods, diagnostic approaches, and outcome measures, an umbrella review method with visual 'stoplights' was used to simplify reporting, thereby enhancing readability and understandability [35]. This method uses color-coded indicators (green, yellow, and red) to represent the strength and quality of evidence, allowing for an immediate visual assessment of the findings. Green indicates strong, consistent evidence, yellow denotes moderate-quality evidence with some inconsistencies and red signifies weak evidence with significant methodological flaws. These tools collectively enable a comprehensive and coherent synthesis of both quantitative and qualitative data, ultimately enhancing the readability and impact of the research findings.

This review included qualitative, quantitative, mixed-method, and review studies to ensure coverage of all relevant pieces of evidence. Only studies published in English were included to ensure accurate data interpretation and possible data translation issues. The studies published from 1846 to 2024 were included in this review. Studies providing relatable to AV experiences in individuals with AN were included to contribute to understanding AV in AN.

Studies that did not specify the AN group were excluded to ensure focus on the target population. Unpublished studies were excluded to ensure the inclusion of peer-reviewed and validated research. Meta-ethnography and single case studies were excluded to avoid data that may not provide generalizable robust evidence.

The electronic databases used for the search were MEDLINE on Ovid, Cochrane Review, CINAHL, Embase, PsycINFO, Web of Science, and ProQuest. The SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) over PEO (Population, Exposure, Outcome) strategy achieved the objective of refining the review question and broadening the methodology. The contextual and intersubjective validity increased with the inclusion of all age ranges, clinical healthcare professionals, carers, family, and immediately connected personnel to lived anorexic experiences due to limited research on AV.

The search terms for the database searches were derived from the SPIDER method, focusing on "exposure in PEO" and "phenomenon of interest". The keywords used were "eating disorder" or "anorexia", combined using Boolean operators 'OR' and 'AND' with terms such as 'critical voice', 'inner-voice', 'voice', 'self-talk', 'inner-talk', or 'dialogue'. The scan of all studies followed three main stages: Initial screening of the title with the abstract, and later duplicate studies due to coinciding timelines in the review. The full content for the participant's voice-related experiential exploration of the AN was analyzed in the final stage. A previous systematic review by Aya et al., analyzed data collected between 1846 and 2018, focusing on AV. To ensure comprehensive coverage and avoid duplication of evidence, the review included all peer-reviewed articles from 1846 to 2024 [10].

## Data collection

The primitive Microsoft Excel tool with an advanced "PIECES" approach extracted data from mixed-method research methods [36]. Efficient data synthesis varied with the different conceptualizations of voice experiences in the included studies. The screening, sorting, and sifting of the whole content of the included studies extracted participant, exposure, outcome and study design characteristics. A detailed screening avoided data duplication.

### Quality appraisal and data analysis

The systematic review, which involved assessing methodological quality and risk of bias, was conducted by AT and independently reviewed by CW. The diversity of research methods employed and the use of appropriate tools increased the robustness and contextual validity of the findings.

Various tools were selected based on the study designs to ensure a thorough assessment. The Agency for Healthcare Research and Quality (AHRQ) was used for cross-sectional attitude and practice assessments, the Mixed Methods Appraisal Tool (MMAT) was applied to mixed research methods, the Critical Appraisal Skills Program (CASP) checklist was employed for qualitative studies, and the Measurement Tool to Assess Systematic Reviews (AMSTAR) was utilized for assessing review quality. These tools were chosen for their relevance and reliability [37-39].

One study highlighted the necessity for a specialized tool for bias assessment in cross-sectional research, focusing on specific domains [40]. For mixed methods systematic reviews, AMSTAR was used for methodological quality assessment and ROBIS for risk of bias, despite some overlap in signalling questions [41]. MMAT reported moderate to perfect quality in mixed-method studies [42]. CASP was widely used for appraising healthcare-related qualitative evidence, although recent suggestions indicated a need for tool modification [39].

Quantitative cross-sectional studies (AHRQ), mixed-method studies (MMAT), qualitative studies (CASP checklists), and systematic reviews (AMSTAR) were meticulously evaluated within domains marked as "yes," "no," or "unclear," with detailed explanations provided [35,38,39,42]. The Risk of Bias (RoB) assessment ensured the validity and transparency of the extracted data [43]. The general Cochrane bias tool was used to analyze mixed methods and qualitative studies, while a specific RoB instrument assessed cross-sectional surveys based on attitudes and practices [44,45].

For reporting guidelines, ENTREQ (Enhancing Transparency in Reporting the synthesis of Qualitative research) ensured consistent reporting of qualitative evidence, while SWiM (Synthesis Without Meta-synthesis) ensured transparency in quantitative data reporting [34,46].

The analyzed qualitative and quantitative data displayed high heterogeneity, mainly due to the lack of standardized tools for measuring Anorexic Voices (AV). Some studies utilized the EAVE-Q scale to assess AV experience in Anorexia Nervosa (AN), but the lack of widespread use of standard tools contributed to high heterogeneity, making statistical meta-analysis unsuitable for this review [20].

The inductive thematic analysis and logic model framework combined findings from the selected studies. Line-to-line coding of extracted evidence was broadly divided into six themes related to AV's relationships with various aspects of participants and the disorder. This structured approach ensured a clear, thorough, and unbiased synthesis of the diverse evidence reviewed.

## Results

The broader keywords with all types of research methods included in this review analysed all available evidence relating to AN inner-voice experiences in studies published from 1846 to 17 May 2024 with the keywords eating disorder* or anorexia* or bulimia* or binge eating disorder* combined with critical voice* or inner voice* or self-talk* or inner-dialogue*. Firstly, 25 studies had titles similar to EDV. The abstracts of all studies revealed 18 types of research on AN related to AV. Finally, after the full-text analysis, ten relevant articles were identified for substantial evidence synthesis about AV experiences as shown in Figure 1.

The characteristics of the ten mixed-method research studies included in the systematic review are detailed in the Tables 1-3.

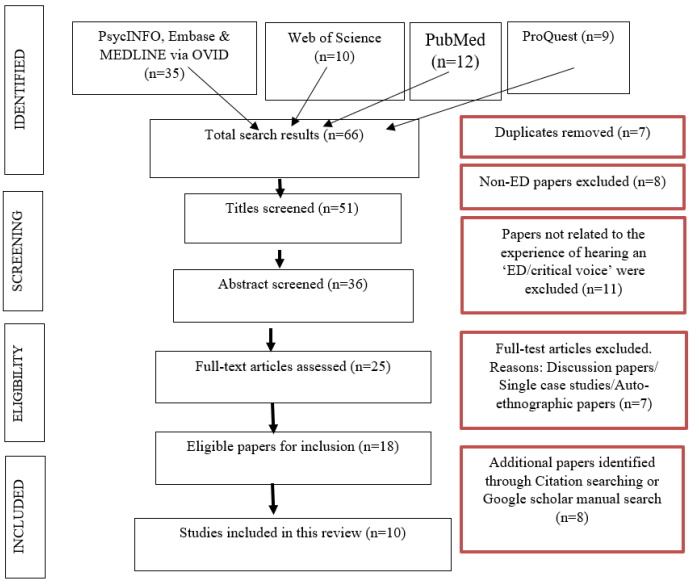


**Figure 1.** Flow diagram of study selection.

**Table 1.** Research study characteristics (Quantitative studies).

| S.No. | Author | Primary investigators | Checked by | Source of funding | Published year | Study Design | Description of timeline of study |
|---|---|---|---|---|---|---|---|
| 1 | Urszula Tokarska, Dorota Ryżanowska | NG | NG | NG | 2018 | Mixed method retrospective study: Convergent design | 2009-2016 |
| 2 | Matthew Pugh, Glenn Waller, Mirko Esposito | Clinicians from patients' self-report | NG | Did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. | 2018 | Quantitative: Cross sectional study | NG |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | Kay Hampshire, Stephanie Tierney, Filippo Varese, Gillian Haddock, Saeideh Saeidi, John R.E. Fox | Stage 1: Scale development: Cognitive interviews; the scale was reviewed by 4 with AN diagnosis receiving inpatient ED treatment from the specialized unit; Stage 2: Psychometric analysis- self-reported and recorded | NG | NG | 2020 | Mixed method study: Qualitative interview and quantitative for EAVE-Q (new tool) assessment | NG |
| 4 | Rebecca Hibbs, Mathew Pugh, and John R. E. Fox | (RH) primary therapist; co-authors (JF and MP) recorded audio each session | NG | NG | 2020 | Mixed method: Single-Case Experimental Design (SCED) for clients diagnosed with AN and experienced an AV; exploratory study | October 2017-December 2017 |

**Note:** NG: Not Given

**Table 2.** Qualitative study design characteristics.

| S. No | Author | Bibliographic details (journal, book, etc) | Study type | Inclusion criteria | Aim and purpose | Study setting |
|---|---|---|---|---|---|---|
| 1 | Laura Smethurst and Daria Kuss | Journal of Health Psychology 2018, Vol. 23(10) 1287-1298 | Qualitative phenomenological research | Eight separate weblogs; pro-recovery AN website (healthy eating and lifestyle) not pro-AN weblogs (promotes unhealthy eating and self-management of extreme starvation); age 18 or above; written in English; between 2013 to 2015; access to the public domain without registration | Exploring insights of treatment experiences of bloggers for better recovery and more effective treatment development | Online weblogs as pre-existent, documented accounts of individuals' experiences of recovering from AN. |
| 2 | Meghan R. Graham, Stephanie Tierney, Amy Chisholm, John R.E. Fox | Clin Psychol Psychother. 2019; 26:707-716+. | Qualitative grounded theory research | Routine involvement in the direct care of adults with AN in a specialist ED service and at least 6 months of experience of direct work with people with AN (speak English) | Exploring the perspectives of HCPs working in specialist ED services towards the AV (for use of AV in interventions) | Four adult ED services (geographical region unknown) |
| 3 | Natalie Chua Yi Ling, Lucy Serpell, Sarah Burnett-Stuart, Matthew Pugh | Clin Psychol Psychother. 2022; 29:600-610 | Qualitative phenomenological research | Self-reported EDV and currently receiving input for AN | Explore the experience and acceptability of Voice Dialogue (VD) amongst individuals with AN who experience an EDV | Public health ED clinics in Greater London (United Kingdom) |
| 4 | Janet Conti, Caroline Joyce, Simone Natoli, Kelsey Skeoch, and Phillipa Hay | Conti et al. Journal of Eating Disorders (2021) 9:151 | Qualitative- grounded theory research | Diagnosed with AN and enrolled or dropout of FBT intervention | This study sought to give voice to those who experience persistent distress post-FBT | Australia, New Zealand and the United Kingdom |
| 5 | Sarah Burnett-Stuart, Lucy Serpell, Natalie Chua, Chloé Georgeaux-Healy and Matthew Pugh | Journal of Constructive Psychology (2024) | Qualitative-grounded theory research | Diagnosed with AN (commonly restrictive subtype of AN) and reported AV. Participants currently receiving ED treatment. All inpatients and were receiving Cognitive Behavioural Therapy (CBT) | This study aims to explore AV's functions, needs and interactions with the participants in AN development using voice dialogical enquiry | Four ED services in United Kingdom |

**Note:** AN: Anorexia Nervosa; AV: Anorexia Nervosa; CBT: Cognitive Behavioral Therapy; ED: Eating Disorder; EDV: Eating Disorder Voice; FBT: Family Based Treatment; HCP: Healthcare Professionals; VD: Voice Dialogue

**Table 3.** Systematic review characteristics.

| S. No. | Author | Publication | Aim and objective | Type of review | Inclusion criteria | Setting | Number of databases searched | Data search range | Publication date range of included studies |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Viviana Aya, Kubra Ulusoy, and Valentina Cardi | 2019 | Systematically review and synthesize evidences on EDV experiences and relation to ED psychopathology | Mixed method systematic review | Refer EDV or self-talk or dialogue; included clinical sample AN or BN pr EDNOS or OSFED or BED; describe findings from voice or self-talk or dialogue; single case, review or dissertation or auto-ethnographic or biographical studies were excluded | NG | 6 search bases; Embase, Medline, PsycINFO, Ovid and science citation index expanded, social science citation index, arts and humanities citation index using web of science and ProQuest British Nursing Index | 1846- Jun-18 | 2005 to 2018 |

**Note:** BED: Binge-Eating Disorder; OSFED: Other Specified Feeding And Eating Disorders; BN: Bulimia Nervosa; EDNOS: Eating Disorder Not Otherwise Specified

## Quantitative outcome

The integration of all quantitative findings from the included studies are shown in Table 4. The quantitative data in these studies was analyzed *via* hierarchical clustering and statistical analysis. The key findings suggest that AN and AV-dominated individuals indulge in excessive exercise and subsequently lose self-identity more [11,20]. The most commonly used diagnostic tool for AV was the EDE-Q before the division of the EAVE-Q scale. The EAVE-Q has high reliability and validity [20]. Benevolent, omnipotent, and malevolent AV were significantly associated with ED pathology, while no association with BMI was observed [47]. Emotion-focused therapy for AV was not significantly related to improved recovery illustrated with comprised quantitative outcomes concluded in all included studies as shown in Table 4. However, with an increased sample size, there is an expected improvement in motivation to change and hope for recovery [21].

## Qualitative outcome (thematic analysis)

The thematic analysis related AV's maintaining factors with recovery influencing variables. The flow of AV's change within phases is not unidirectional, which aligns with subjective illness behavior. The characteristics of AV based on the transitions could be segregated into six main themes as shown in Table 5. The logic model framework in this systematic review efficiently illustrated AV's complex functioning with patients and AN as shown in Figure 2 [48].

The subjective relation of AV since AN-onset transformed from benevolent to malevolent with time. After participants realized the malevolence or omnipotence of AV's harmful intentions, the majority reported a self-conflicted state. The subjects prioritizing self-protection developed the fear of self-functioning post-AV dissociation. Similarly, the embracement of AV in individuals revealed a common lack of support and fear of emptiness. However, difficult self-confrontation with AV was proven to aid recovery with regained social and self-reconnections.

The attributes of AV in all six major classified domains are illustrated collaboratively in a logic model framework as shown in Figure 2. Some reported the identifiable presence of AV, while AV was absent in some. An AV-based therapeutic strategy imposed in AV unidentified AN cases could increase self-identity fragmentation. The AV at the initial stage would act similar to a companion who instructs as a friend targeting self-improvement. Later, the voice becomes 'know-it-all' or 'deity'. They provoked people to be more impulsive and adhere to self-harming instructions. Post-realization of their self-destructive behavioural pattern followed submission to AV in a self-conflicted state. The fear of self-functioning without AV leads to increased acceptance. This stage would resist AV externalization. However, psychologically repaired self-identity accompanies self-awareness of the need for AV separation. The process of self-talk with AV at a later stage was risky, but it awarded an equal status to participants. This empowered state motivated people to regain self and social reconnections without the existence of AN and AV aiding recovery.

## Theme 1: Identifiable AV in self

The subjects have reported an easy recognition of AV or fear of AV confrontation led to the denial of its existence and falling into a self-dilemma of disorder existence with unrecognized AV [16,21]. The face-off of self (patients) with AV created transparency of participants' illnesses [13]. The process of externalizing equipped participants with tools to combat and hope for recovery. However, the patients without AV presence or unrealized co-existence could lead to fragmented self-identity and disorder denial, which prevents access to required external support [13,16].

**Identified and accepted AV:** The AN-driven actions of people countered the submissive response of patients out of habit. With the forever existence of AV, people ignored the presence of any external agency affecting their actions. The AV personified during therapies was made significantly aware to patients about its existence [13].

"This is an opportunity to think about things I tend to avoid thinking or talking about" [11].

"I'm so used to it I didn't notice it" [21].

"It's so easy to get so consumed in this world that, you know, it is not normal but it's just so your norm and it became your reality" [13].

**Identified and denied AV:** The social perception of auditory hallucination as the diagnostic feature of schizophrenia resulted in denial of AV's prevalence [8]. The intentional masking of AV amplifies the experienced psychological distress. Some reported denying AV for self-protection against adverse after-effects [21]. People were more readily choosing to entertain suicidal thoughts in themselves than seeking help. This phase indicates a need for improved awareness and wide acceptance of a non-judgemental stance of AV [49].

**Scared of AV:** The fear of opposing dominant AV made people choose self-harm over seeking help [16]. Similarly, the family inclusion in Family-Based Therapeutic (FBT) intervention reported participants hiding actual feelings to avoid causing others emotional distress [49]. The fear of revealing childhood traumatic experiences underlying AV also led to the refusal of AV presence [47].

"It felt like an unsafe thing to do" "I can ignore my AV if I really want to" [21].

"The shin splints and the fractured pelvis and the compressed discs and the broken toes, they're still running, running, running on the treadmill, to get away from the voice" [16].

"There were feelings of just wanted to end it (my life) because it's easier than the voices in your head" [49].

"It comes from a place of pain and hurt and all of that, and its grown stronger trying to protect me" [13].

**Fear of social acceptance:** The psychological stress due to AV associated with social unacceptance has resulted in reduced overall quality of life [20]. The urge to reconnect could be a vital encouragement to recover, while the fear of rejection from society could explain the non-disclosure of internalized struggle [12,50]. Overall, the denial of AV is unintentional protection of personal psychological health.

"What will this individual think if I say I am hearing a voice" [16].

"I can numb things for her...if she focus on me, then she wouldn't be focusing on the dark things that happened [51]."

**Unidentified AV:** The patients with clinically undiagnosed presence of AV invalidated self-right to be AN diagnosed and receive prospective treatment [13,21]. The AV framework generalized for all subjects made them feel worse than before [16,21]. The objective of AV should be marker focused under the 'not-one-size-fits-all' therapy model [16].

"Not something I identified with before, and I still don't think I do" [21].

"Felt strange or forced" [21].

"I don't think I've got AN because I don't have the anorexic voice" [16].

"If they don't relate to it, then try something else, it's not one-size-fits-all" [16].

"I think this can work for some people, but to me, it's always felt quite like condescending like I'm some like freak patient" [13].

**Table 4.** Quantitative findings extracted from all included studies.

| S. No. | Author | Diagnostic method | Measured effect | Data collected | | Analysis or findings |
|---|---|---|---|---|---|---|
| 1 | Urszula Tokarska, Dorota Ryżanowska | Semantic and hierarchical cluster analysis of textual narrative description | Semantic categories | C:1- Above position | C2: Below position | Above-positioned AN in patients resulted in a higher level of self-criticism with more attachment to malevolent AN. The harder to dissociate and greater barrier for recovery than below positioned AN. |
| | | | Positive assessment (14) | 12 | 2 | |
| | | | Negative assessment (26) | 18 | 8 | |
| | | | Textual mode: Description (3) | 1 | 2 | |
| | | | Textual mode: Monologue or dialogue (37) | 28 | 9 | |
| | | | Task-oriented: Internal motivation (23) | 16 | 7 | |
| | | | Task-oriented: External motivation (16) | 10 | 6 | |
| | | | Reader: Foe (36) | 29 | 7 | |
| | | | Reader: Friend (21) | 15 | 6 | |
| | | | Reader: Profit (35) | 25 | 10 | |
| | | | Reader: Loss (37) | 29 | 8 | |
| | | | Relation (RL): Author and reader (28) | 22 | 6 | |
| | | | RL: Persistence in recovery (28) | 27 | 1 | |
| | | | RL: Persistence in disease (13) | 6 | 7 | |
| | | | RL: Rumination (19) | 15 | 4 | |
| | | | RL: Dissociation (24) | 24 | 0 | |
| | | | RL: Above-positioning (30) | 29 | 1 | |
| | | | RL: Below-positioning (31) | 21 | 10 | |
| 2 | Matthew Pugh, Glenn Waller, Mirko Esposito | VPDS (Voice Power Differential Scale) | Voice power | 23.8/26 (4.67) | | ANOVA analysis p=NS |
| | | BAVQ-R (Beliefs about Voices Questionnaire, Revised) | Voice characteristics: Benevolence; | 4.73/26(3.65) | | p=0.005 |
| | | | Malevolence | 8.12/26(3.18) | | p=0.04 |
| | | | Omnipotence | 11.2/26(3.73) | | p=NS |
| | | Voice frequency and distress | Frequency | 7.6/26(1.87) | | p>0.05(NS) |
| | | | Distress | 6.60/26(2.61) | | p=(NS) |
| | | BMI *vs* BAVQ | Voice characteristics *vs* AN (BMI) | | | p=NS; R2=-0.154 |
| | | EDE-Q (global) *vs* BAVQ | voice characteristics *vs* AN (EDE-Q Global score) | | | p=0.004; R2=0.497 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | Kay Hampshire, Stephanie Tierney, Filippo Varese, Gillian Haddock, Saeideh Saeidi, John R.E. Fox | The EDE-Q 6.0; Depression Anxiety Stress Scale-21 (DASS-21); World Health Organization QoL Assessment (WHOQOL-BREF) | **EAVE-Q domains devised-**<br>**EAVE-Q:1- benefits of adherence**<br>My AV makes me feel in control (0.837); my AV gives me a positive sense of routine and order in my life (0.754); doing what AV says makes me feel happy (0.630); doing what AV tells me makes me satisfied (0.626); my AV makes me feel confident (0.499); | **Significant (sig.) correlation between EAVE-Q 1 and other domains:** | |
| | | | | Compassionate AV | 0.567 |
| | | | | Turning away from others | 0.277 |
| | | | | Dominated by AV | 0.291 |
| | | | | **Sig. correlation Clinical outcomes and EAVE-Q 1:** | |
| | | | | EDE-Q global mean (n=148) | -0.234; p<0.01 |
| | | | | EDE-Q restraint; | 0.237(<0.01) |
| | | | | EDE shape concern | 0.231(<0.01); |
| | | | | EDE weight concern | 0.237(<0.01) |
| | | | **EAVE-Q:2- compassion**<br>my AV is supportive (0.826); my AV is comforting (0.788); AV is a friend to me (0.759); my AV understands me when other people do not (0.548); | **Significant correlation factor analysis-** | |
| | | | | Benefits of adherence | 0.568 |
| | | | | Turning away from others | 0.389 |
| | | | | Externalizing AV | 0.243 |
| | | | | dominated by AV | 0.209 |
| | | | | **Sig. correlations with EAVE-Q 2 and clinical outcomes-** | |
| | | | | EDE-Q (global) | 0.312(<0.001) |
| | | | | EDE-Q shape | 0.319 (<0.001) |
| | | | | EDE-Q weight con | 0.359 (<0.001) |
| | | | **EAVE-Q:3- turning away from others**<br>my AV makes me think other people just want me to get fat (0.899); my AV tells me not to trust other people (0.861); my AV makes me think I do not deserve other people's help (0.455); | **EAVE-Q significant correlation factor analysis-** | |
| | | | | Benefits of adherence | 0.277 |
| | | | | Compassionate AV | 0.389 |
| | | | | Externalizing AV | 0.201 |
| | | | | Dominated by AV | 0.297 |
| | | | | **Sig. correlations EAVE-Q and clinical outcomes:(n=148)** | |
| | | | | Age of onset | -0.313 (<0.001) |
| | | | | EDE-Q global | 0.442 (<0.001) |
| | | | | Restrain | 0.322 (<0.001) |
| | | | | Eating concern | 0.284 (<0.001) |
| | | | | Shape concern | 0.410 (<0.001) |
| | | | | Weight concern | 0.360 (<0.001) |
| | | | | **Sig. correlation EAVE-Q Domain *versus* DASS-21 (n=141)** | |
| | | | | Total score | 0.472 (<0.001) |
| | | | | Depression | 0.396 (<0.001) |
| | | | | Anxiety | 0.472 (<0.001) |
| | | | | Stress | 0.347 (<0.001) |
| | | | | **Sig. correlation EAVE-Q with WHOQOL-BREF domains** | |
| | | | | Physical | -0.320 (<0.001) |
| | | | | Psychological | -0.377 (<0.001) |
| | | | | Social | -0.227 (<0.01) |
| | | | | Environmental | -0.302 (<0.001) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | **EAVE-Q:4- externalizing by AV or AV as external entity**<br>I experience my AV as thoughts that are not my own (0.922); I see AV as separate from my own identity (0.672); My AV is like hearing someone else's thoughts and feelings (0.576); | **Sig. correlational factor analysis-** | | | |
| | | | | Compassionate AV | -0.243 | | |
| | | | | Turning away from others | -0.201 | | |
| | | | | Sig. correlations of EAVE-Q4 and clinical outcomes- No Sig correlation with EDE-Q all domains, DASS-21 all domain; WHOQOL-BREF all domains | AV as external entity is not linked with ED-pathology, psychological stress and life quality | | |
| | | | **EAVE-Q:5- dominated by AV**<br>it does not matter what I do my AV always wins (0.795); I can ignore my AV if I truly want to (reversed) (0.639); my AV controls me (0.606); | **significant correlation factor analysis-** | | | |
| | | | | Benefits of adherence | -0.291 | | |
| | | | | Compassionate AV | -0.209 | | |
| | | | | Turning away from others | -0.297 | | |
| | | | | **Sig. correlations with EAVE-Q 5 and EDE-Q** | | | |
| | | | | EDE-Q global | 0.482 (<0.001) | | |
| | | | | Restraint | 0.493 (<0.001) | | |
| | | | | eating concerns | 0.314 (<0.001) | | |
| | | | | shape concerns | 0.350 (<0.001) | | |
| | | | | weight concerns | 0.350 (<0.001) | | |
| | | | | EDE-Q compulsive exercise | 0.226 (<0.01) | | |
| | | | | **Sig. domain *versus* DASS-21: stress** | 0.294 (<0.001) | | |
| | | | | **sig. domain *vs* WHOQOL-BREF:** | | | |
| | | | | Physical | -0.295 (<0.001) | | |
| | | | | Psychological | -0.266 (0.001) | | |
| | | | | Social | -0.305 (<0.001) | | |
| 4 | Rebecca Hibbs, Mathew Pugh, and John R. E. Fox | **Psychopathology measures-**<br>EDE-Q; Hospitality Anxiety and Depression Scale (HADS);<br>pros and cons of AN scale (P-CAN); standardized measures; EAVE-Q AV experience;<br>Brief illness perception questionnaire; ED-15; Motivation to change;<br>Hope of recovery | **PRE-EFT-AV** | **POST-EFT-AV** | **Pre-EFT-AV** | **Post-EFT-AV** | p- value |
| | | | HADS-A | HADS-A | 15.5(15) | 16.5(12) | HADS-A 0.144; |
| | | | HADS-D | HADS-D | 8(20) | 9.5(19) | HADS-D 0.102; |
| | | | EDE-Q | EDE-Q | 3.74(3.48) | 3.43(3.76) | EDE-Q 0.273; |
| | | | PROS –CONS | PROS –CONS | 0.13(1.05) | 0.14(0.7) | PROS 0.715; CONS 0.144 |

**Note:** RL: Relation; EFT-AV: Emotion Focused Therapy Anorexic Voice

**Table 5.** Themes and sub-themes generated.

| Thematic classification | | Sub-themes |
|---|---|---|
| Phase1 | Identifiable AV in self | Identified and accepted AV |
| | | Identified and denied AV |
| | | Scared of AV |
| | | Fear of social acceptance |
| | | Unidentified AV |
| Phase 2 | Change in relation to AV with AN and self | Benevolent AV |
| | | Malevolent or omnipotent AV |
| Phase 3 | Self-realization of intended harm of AV and AN | |
| Phase 4 | Domination of self above AV | Improved sense of responsibility<br>Freedom from self-blame<br>Big change to equal status: AV and self |
| Phase 5 | Self-confliction in AV dissociation | Denying dissociation<br>Accepting dissociation |
| Phase 6 | Signs of AN recovery | |

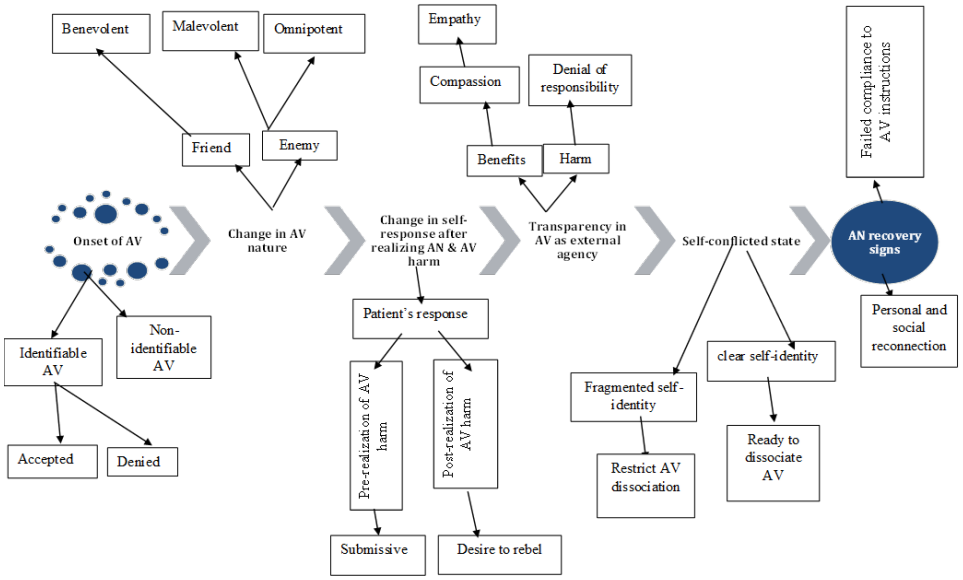


**Figure 2.** Logic model of AV functioning.

## Theme 2: Change in relation of AV with AN and self

The different subjective AV reported unpredictable flow of voice characteristics with the effect of indefinite factors affecting an individual's mood and surroundings [19]. However, similar patterns of change in AV with AN progress generated sub-themes.

**Benevolent AV-a friend of AN and self:** The early stage of AV indicated a secure, companion, and guidance-providing illness [10]. The voice was compassionate and positive [20]. The friendship of AN and self fulfills the desire of participants to reach body goals [11]. AV acted as an aid to voice self-opinions out loud for others and the self [49]. The compassionate AV who befriended themself also turned away from others [20].

"Mainly it was expressing my opinion to others, that it was most, most helpful" [49].

"My AV gives me a positive sense of routine and order" [20].

"I'm like a mum to her, I can keep her safe…like a guardian angel [51]."

The befriended self-critical inner voice brought self-satisfaction [20]. High compliance to compassionate voice originates stress in some, while some reported reduced psychological strain due to AV [16,20,51]. High adherence to negative ED psychopathology with AN and self-shared personal improvement values, but another study observed reduced negative eating attitudes with benevolent AV [47,51,52].

"My AV understands me when other people don't" [20].

"If I do this (as AV says) I don't have to experience the anxiety" [16].

**Malevolent or omnipotent AV- a friend of AN and foe of self:** The prolonged illness with controlling, critical, dominating, and AV demanded obedience from patients changed their view of illness [10]. This phase denotes the most impulsive and severe AV favoring AN [20]. The transition of AV from being a friend to a 'know-it-all' capable dominator above self-received the majority of submissions [11]. The loss of self-control and helplessness due to dominating AV and AN prominently increased psychological stress and negative eating attitudes in patients [11,47].

"It does not matter what I do my AV always wins" [20].

"It's a bullying, secretive thing, where the only thing it usually contacts with is me" [13].

The stronger voice linking significantly to Childhood Emotional Abuse (CEA) drove more negative ED psychopathology in participants [47]. Their

internalized emotional abuse experienced from bullying, rejection, and humiliation is expressed through aggressive, controlling, or highly critical AV [14,47]. Trusting their critical voice revealed intended self-protection. It was more reliable for them than turning to foreign agencies offering help. They framed AV as their well-wisher [16]. A study highlighted the nature of AV which challenged competing relationships by painting other people as threatening or ill-intentioned [51].

"It comes from a place of pain and hurt and all of that, and it's grown stronger trying to protect me" [13].

"Her boyfriend was a big threat to me…so I pushed him away [51]."

"Having a bully is better than no one" [16].

The struggle-entrapped patients who desired to gift a non-blaming stance to others made it more difficult to verbalize their inner turmoil. It resulted in an escape mechanism that provoked suicidal thoughts. The family inclusion in FBT highlighted some being grateful for unconditional reliance to share their psychological stress, while others felt insignificant and unheard in their recovery [49].

"My parents had full control which made me feel safe" [49].

"For my parents, they wouldn't have known why I was acting out either, as I couldn't verbalize what was happening internally" [49].

The omnipotent voice with prolonged illness duration denoted as 'deity' significantly indicated severely abusive AV affecting the overall quality of life [10,20]. The abusive relationship associated with negative ascetic attitudes caused weight reduction, contradicting studies that indicated voice to be unrelated to BMI [10,15,47,53]. About 24% of physiological (BMI) variance resulted from an abusive relationship with AV. The usual self-defeating response to overcontrolling AV could lead to failed recovery even with the most efficient therapy. The AN with AV and reduced BMI indicated severe and prolonged illness [10].

## Theme 3: Self-realization of intended harm of AN and AV

The initial indicator of "real battle" begins with the onset of feeling lonely, unworthy, sad, scared, helpless, and vulnerable [10]. The aligned statistical and thematic findings of intentional harm of AV towards self-made them more self-aware, with improved motivation to change, more threat-awareness, better coping mechanisms, and tagged AV from 'friend' to 'enemy'[11]. The high level of entrapment of self with AV and low BMI predicted higher levels of 'fight' [10].

"The only thing you gave me was an illusionary sense of control" [20]

"My AV tells me not to trust other people" [20].

The confrontation with AV resulted in parallel alignment with the initial intention of self-protection [13]. However, this changed the choice of expressing their negative emotions through a healthy coping mechanism.

"I definitely needed (AV) at that time, but now it's like I go back to it out of habit. It's like an overprotective, kind of self-serving abusive relationship" [13].

A participant in Chua et al., expressed compassion post-self-talk revealing AV's desperation for self-protection [13].

"(AV) trying its best to get me through life, but it's struggling as much as I am" [13].

## THEME 4: Dominating self above AV

**Improved sense of responsibility:** The engagement and understanding of AV equipped individuals to wilfully seek recovery as their responsibility [21]. The voice characteristics remained consistent after the 'face-off' phase, but it self-motivated them to choose their freedom [11]. This stage ultimately became a vital factor motivating change and hope for recovery in AN patients [21].

"This is my life and I'm responsible for it" [11].

"The voice is still doing what he/she does. I just have more tools to combat it. Now I'm more interested in combating it" [21]

"My recovery was in my hands, and that I was not helpless"-regaining control [12].

**Freedom from self-blame:** Many started to oppose or rebel against AV by anticipating AV's ill-intentions forcing them through instructions under the medium of self-improvement [12].

"I do the exact opposite of what (AV) is telling me to do" [12].

Externalizing AV removed self-guilt and blame while treating disorder-causing factors as the external agents that they need to combat to win [16].

"Coming from disorder, from something separate that they're fighting than from them personally" [16].

**Big change to equal status:** AV and self: A significant recovering mark at this phase was witnessed when 'face-off' demoted AV and promoted self from being sub-ordinate of AV [13].

"I feel like an equal status to it, rather than like a lower whose being bullied" [13]

## Theme 5: Self-confliction in AV dissociation

This phase can be called the 'self-dualism' state [13,47]. The dissociation model varies subjectively depending on their power of voice and desire to improve life quality [29,47]. The process of separation is observed to be challenging but helped to improve recovery.

**Denying dissociation:** The weight restoration aims of all therapeutic interventions around AN arouse fear in patients of weight regain and lost treatment engagement [49]. The intensity of fear entangles AV with self-recovery resistance [11].

"I don't want to fight with you because otherwise, I would have to gain weight"[11].

"It part of me most of the time so externalizing it was hard" [21].

Similar to earlier phases, reduced sense of responsibility, fear of no-reliance, and underlying emotional distress exposure caused AV to increase adherence to voice. The concept of AV as an external agent sometimes seized their will to fight for recovery by denying ownership [54]. This stage resulted in a highly dissociated self-state [47]. Therapies revealed unexpected results of imposed AV framework confusing self-identity and wellness without AV [13]. Thus, the participants need to find external support to resolve conflicted self-identity and to realize the controllable AV to motivate externalization and recovery.

"Well, it's nothing to do with me or I can't take responsibility for it" [16]

"Hovering between relapse and wellness, deciding which path to take" [12].

"Push someone too far, because their self can become fragmented." [12].

"I don't know how people cope with day to day life without having something like this to rely on" [13].

"If I take that voice away, what I'm left with is kind of emptiness" [16].

**Accepting dissociation:** The realization of malevolent AV could not completely break the link between AV and self. The AV-separation process was relatively more difficult than expected, but successful AV dissociation overcame the self-conflicted state and tangled thought processes. However, the motive behind AV of self-protection could not encourage AV embracement [20]. Post-therapy impact of externalizing AV was worth taking the risk [21].

"But I see it as something that I need to move away from. Like I need that independent. I need to become myself" [13].

"It was difficult, but I think it was worth doing it" [21].

The hope to overcome self-harming voice intentions restricted recovery. The VD therapy helped to personify AV where subjects expressed hidden anger and frustrations to self-harming instructions [13]. The motivation increased with realized unconditional loved ones' support with the hope of regaining happiness together [49].

"The voice feels like it's a person that I want to get angry back at" [13].

"To separate the two makes me feel like hope, like I can get rid of (AV) [13]."

"How hard it must have been for my parents and how- what a good job they did to persevere and get me to where I am today" [49].

### Theme 6: Signs of AN recovery

**Reconnection hypothesis:** The strong desire to reconnect with missed opportunities and happiness connected with successful malevolent AV actions motivated individuals to regain impaired self-esteem and psychological stability by recovering [12,50].

"My mind goes towards missed opportunities, friendships, experiences, unshown gratitude, the untasted food" [12].

"My self-esteem and body image is probably the best it's ever been" [12].

Separation from AV helped break the connection of self with AN's instructions. The process further revealed other interests and qualities of AV to regain control of their choices [16]. The new change chose healthy coping mechanisms for expressing negative emotions [12]. It helped people to break the AV's illusionary false sense of security.

"It completely consumes me. I need to fight against it, even my body is trying to trick me, my mind is trying to trick me" [13].

"It's going to be really hard, but as soon as you come out the other side and start living your life again and being healthy, the thoughts go away" [49].

An overlook of all the themes and sub-themes generated provided transparency in the change in the relationship of participants with their illness and the voice experienced. Though all participants would have subjective variation in the nature of voice and disorder experienced, compensatory behaviour attached in different phases would provide better insight into their state of mind. Therefore, psychotic interventions would be able to provide better assistance under an efficient healthcare management system.

## Discussion

This review explored the perspective of AV in 258 patients and 15 HCPs from included studies excluding systematic review participants based on incomplete reporting. The Cochrane review databases indicated a single review of EDV experiences [4]. However, the included review had the lowest methodological quality (61%) among other studies involved.

This study observed a high correlation between the changing nature of AV with AN recovery as shown in Figure 3. A review also observed a difference in cognitive ability in AN subtype, indicating more impairment in ANR than ANBP [22]. The lower BMI with high restrictive perfectionist ANR differed from more impulsive ANBP [22,55,56]. The clinical utility of AV difference based on subtypes is difficult due to undistinguishable differences between ANR and ANBP [55]. Nevertheless, there is a significant relation between AV with BMI and QoL. The AV was reportedly independent of reduced BMI in AN, while AV commonly desires thin body ideals indulging people in impulsive restrictive behaviors resulting in 24% BMI variance [10]. The self-realization and awareness of AV implanted anger to resist or compassion to resolve AV [13]. The targeted self-sympathy in both scenarios empowered recovery resolutions.

The failed therapies are commonly unprioritized Childhood Emotional Abuse (CEA) and internalized negative emotions [47,51]. The alternative reasons were initial weight or nutrition restoration objectives and therapeutic framework designs without participants' consent for recovery plans [49]. The onset of AV highlighted high social exclusion that changed to social reconnection desires with recovery signs (reconnection hypothesis) [12,13,20,51]. However, the recovered state of mind with unconditional external support and repaired self-identity improved social inclusion desire and the overall quality of life.

The ungeneralizable physical, social or psychological environment in each AN case led to a multidirectional flow of AV. The AV progressively reflected AN characteristic within six framed themes post-analysis. The onset of AV and AN incorporated positivity with benevolent, compassionate, friendly, reliable, companion, and well-wisher acts. The objective of AN and AV turns to adopt harmful methods for accomplishing desired goals [11,20]. This malevolent, deity, know-it-all, omnipotent, harming, abusive boyfriend, bullying, pushing to guilt or blame, and forcing defines changed AV actions at this stage [10,11,16,20,47,49,51]. Most patients' fear combat and self-identity fragmentation reciprocate submissively [13,16,21,47]. Slowly AV became an irreplaceable habit [13,57]. The fear of dissociation initially reflected compassion for the companion, whereas it originated later from emptiness and hesitant self-functioning without AV [16].

However, VD indulged compassion-based unconditional support in some, while others desired freedom from AV [13]. The combat was risky as expected but worth the changes post-battle. Some also expressed relieved internal pain post-self-talk [13]. The 'reconnection hypotheses' implanted the desire to regain loss from AN acceptance, social exclusion, and self-doubts. The separation of AV accompanied self-discoveries and signs of improved overall quality of life [51]. The novel therapies needed to focus more on healing the underlying emotional stress or negative emotions to improve negative eating attitudes, voice power, or violent compensatory behaviour before weight or nutritional restoration of patients. The thematic analysis assisted with the following observations.

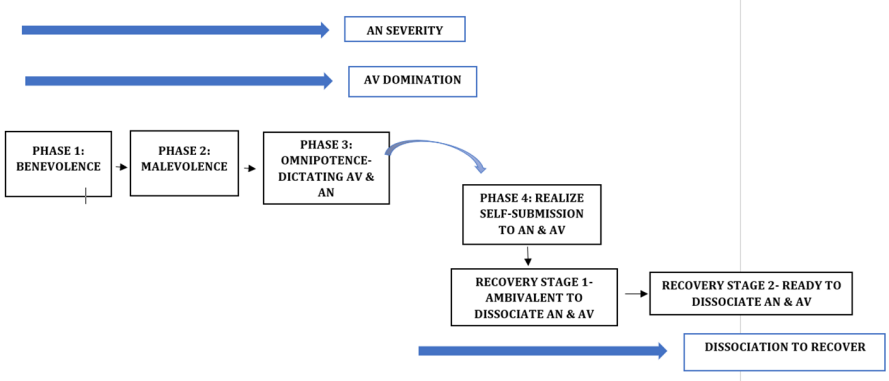


**Figure 3.** Transition of AV from onset to recovery.

### AV: Identified or unidentified

The AV in people either were classified as identified or unidentified. The people expressing the presence of identified AV indicated high therapy acceptance [11,20,47]. Some people expressed habitual submission to highly dominant AV [13]. They identified AV as a habit that 'always wins' against them. Some people felt forced to accept the voice standardized recovery design [21,49]. The 'forced therapy' orienting voice created uncertainty of the disorder's presence.

### Change in relation to AV with AN and self

The onset of inner voice overcame the emptiness caused by internalized traumatic events. The participants trusted AV with the upliftment of life quality and self-identity [20]. The change hereafter observed harmful instructions directed by AV towards achieving pre-targeted goals. The companion changed to an abusive boyfriend [49]. The increased 'malevolence' or 'omnipotence' originated submissive with hatred towards AV. The severity of AN compensatory behavior was at its peak at this stage.

### Self-realization of intended harm of AV and AN

The recent awareness of AV combated stigmatized voice hallucinations opinions with improved disclosure and acceptance [15]. The interventions such as self-talk, VD, or chair-work provided clarity of heard voice quality. The personified AV faced anger, frustration, or aggression, while some reacted with compassion towards the suffering voice [13]. However, the positive relationship does not hinder the reduction of ED pathology or voice power [11].

Moreover, the voice greatly resembled internal emotional stress that provoked self-protection [47]. The failed therapeutic revealed deficit trust from both ends that restricted recovery. High relapse post-recovery observed treatment plans consented from family or clinical staff without patients' approval [49]. The distrust, lack of willpower, and blame towards patients from clinicians also resisted improvement [16].

### Domination of self above AV

The 'equal statuses' attained by participants post-self-talk therapies with voice increased motivation with better hope for recovery. The emptiness or pain from internalized stress originates from AV-induced compassion. However, some also voiced anger towards AV. Both reactions demanded self-sympathy or self-love [13]. Although the voice and disorder were functioning the same, the counteraction from subjects changed. The majority aspired freedom at this stage.

### Self-confliction in AV dissociation

The self-conflicted state resulted in depleted confidence in self-functioning without AV existence. The lack of confidence in self-functioning in patients embraced AV [10]. The recovery journey without external support, empathy, and a self-motivated state of mind restricted AV dissociation [16].

### Signs of AN recovery

The reduction in VPDS (voice power) observed lower EDE-Q (negative eating attitudes) and increased WHQOL-BRableEF (quality of life) [10,20]. The qualitative experiences of complete recovery were not recorded in studies. Psychotic voice confrontation-based therapies are expected to significantly motivate without impacting voice characteristics [13]. Moreover, condition acceptance, externalized AV, social inclusion and self-identity strengthening were also highly associated with recovery.

### Future research

High heterogeneity of diagnostic methods of all included studies needs further researches for selection for standard diagnostic tool specifically for AV. Purposive sampling of males is required to meet requirement of increased male cases. More definite behavioural patterns studies for AN-subtypes should be focused. The patterns of AV with other voice hearing psychotic disorders needs to be relatively studied. More quantitative and qualitative pieces of evidence revolving voices compelled compensatory eating pathologies to be collected. New AN and AV combined recovery targeting policies and interventions efficacy should be investigated. Furthermore, AN-subtypes with coinciding features needs to explore if any difference in AV difference in both sub-types [22].

## Conclusion

The complex AV behavioural patterns are significantly associated with AN recovery. Low BMI driven by AV reflects the high severity of AN. The awareness and normalization of voices heard in AN could break the social stigma and improve social acceptance. An externalized and recovered AV would improve overall life quality. Vital virtues such as motivation, optimism, empathy, compassion, and unconditional support personally or externally aid self-functioning. The AN recovery process should prioritize AV separation. However, AV framework-based interventions not be imposed on AN patients with absent AV.

## Limitations

Firstly, the primary tool for assessing AV is the EAVE-Q, developed by Hampshire and colleagues in 2020. This is the first validated tool for AV assessment but most quantitative studies included in this review used different tools that weren't customized for AV. This inconsistency in measurement methods challenged comparative analysis affecting the reliability of the findings. Secondly, this review only includes English-published research studies leading to language bias. Thirdly, AN can be categorized into subtypes based on restrictive behaviors or binge-purge patterns. AV can differ for these AN sub-type significantly, adding another layer of complexity and challenge to this review. Finally, the research on AV is relatively new and the studies included are devoid of equal participation of all genders, age groups, cultural beliefs, and demographics. This lack of diversity can lead to non-generalizable findings for the targeted populations.

## Declarations

### Ethical approval and consent to participate

The systematic review conducted in this study utilized studies involving participants without any primary interaction or involvement of the participants themselves. No personally identifiable information, including participant names, was utilized or compromised in the studies involved. Thus, this systematic review strictly adheres to ethical considerations.

Given that this systematic review did not involve direct interaction with participants, informed consent was not applicable. However, it is important to note that all the studies included in this systematic review were conducted ethically, and participant confidentiality was not compromised.

### Consent to publish

The authors of this study provided consent for publication, affirming the validity and authenticity of the data extracted and conclusions drawn herein.

### Availability of data and material

The data and materials utilized in this study, including the selection of studies and the quantitative, qualitative, and mixed methods research data, along with line-to-line coding thematic analysis, are readily available. Researchers interested in accessing these data for non-commercial purposes can obtain them by contacting the author directly. We are committed to ensuring the transparency and reproducibility of our findings. Thus, we welcome inquiries and promptly provide any necessary justification or clarifications. Additionally, we recognize the importance of data sharing in scientific research and encourage readers 0to reach out to access the datasets supporting the conclusions of this study.

## Competing interests

The authors declare no competing interests

## Funding

This study is not applicable because the systematic review did not involve any primary data collection or utilized additional resources beyond the literature.

## Author's contribution

The main author, AD, conceived the research idea, developed the research plan, conducted the systematic review, performed the methodological quality assessment, and evaluated the risk of bias. AD also drafted the manuscript for the entire research study.

The research was conducted as part of AD's individual project for the master's studies, with supervision from Professor C. W. Professor C.W. served as the project supervisor, providing guidance and oversight throughout the research process. Additionally, Professor C.W. acted as an independent reviewer and provided valuable feedback to improve the manuscript.

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