



# Assessment of psychotic disorders among prelingually deaf individuals

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## Abstract

**Purpose:** This review discusses the assessment of psychotic disorders in prelingually deaf patients and the related challenges.

**Views:** Although prelingually deaf patients are often diagnosed with psychotic disorders, the clinical presentation of this group is complex and no clear guidelines regarding the assessment process can be formulated due to the lack of valid, reliable research. Sign language dynamics or language dysfluency may be falsely recognized as disorganized thinking. Some of the symptoms indicating disorganized thinking in the case of spoken languages may fulfill specific functions when used in sign language (for example object chaining). Furthermore, deaf individuals experience multiple stressors that may be considered as risk factors for developing delusions, especially for those growing up in hearing, non-signing families. Nevertheless, it is important to acknowledge that some seemingly delusional beliefs shared by prelingually deaf people may be associated with the lack of assisted learning, gullibility, low level of confidence in healthcare or deaf communities' social norms. The question concerning the sensory modality of hallucinations experienced by deaf individuals remains unresolved. Patients' accounts suggest that hallucinations described as auditory may be perceived as lip-reading without identifying the speaker's face, among others. However, for those who provide help it is far more important to recognize the function of hallucinations and to differentiate them from normative experience.

**Conclusions:** It is essential to expand our knowledge regarding the clinical presentation of psychotic disorders in deaf individuals in order to develop assessment guidelines and tools and, above all, increase the well-being of those suffering from psychotic disorders, as well as of those whose diagnosis remains unclear.

**Key words:** psychosis, delusions, hallucinations, prelingual deafness, language dysfluency.

## INTRODUCTION

The prevalence of mental illness, including psychotic disorders, among deaf individuals remains a field of research without sufficient reliable, wide-reaching and current data. When trying to reference the source literature, one can often come across a fundamental issue of inconsistency regarding even the definition of basic terms. Some research does not acknowledge the differences between prelingual and post lingual, congenital and acquired deafness or between individuals raised by hearing and deaf parents [1]. Excluding the characteristics and causes of deficits related to specific types and degrees of hearing loss from research makes the conclusions inapplicable for practice.

The purpose of this review is to present selected problems of psychotic disorders among prelingually deaf individuals who use sign language as their first language, in comparison to hearing individuals. Speech development is the key criterium for hearing loss classification in this case.

Based on it, we differentiate prelingual deafness occurring before language acquisition and post lingual deafness occurring after language acquisition. Consequently, unless indicated differently, the characteristics of the symptoms discussed relate to the prelingually deaf population, and its description is based on the research concerning this specific population.

Due to the classification issues already mentioned, it is difficult to fairly estimate the scale of the prevalence of mental illness among particular deaf groups. Nowadays, however, it seems clear that deafness itself does not act as a direct cause of illness. Lindzen indicates that it may be considered as a risk factor for psychotic disorders because of frequent cooccurrence with deficits regarding interpersonal relationships (difficulties in communication, isolation, social withdrawal), neurocognitive functioning (deficits in cognitive functions and development of theory of mind) and neurobiological functioning (for example deafferentation) [2]. There is a possibility of a common

cause (for example genetic or infection-related) underlying both hearing loss and psychotic disorders [2]. However, some of these deficits, especially for the prelingually deaf, seem to be closely related to the environment and conditions in which the process of the childhood development of a deaf individual takes place.

Based on the Belgian data, Cole and Zdanowicz suggest that deaf patients are frequently diagnosed using the “unspecified psychosis” category [3]. The authors indicate that the majority of these assessments are at least questionable in terms of both reliability and validity, making it difficult to draw conclusions regarding the prevalence of not only psychotic but also other mental disorders.

One of the most critical issues is sharing a language with parents or caregivers, which is essential for a child to realize its development potential [4]. Tomaszewski suggests that negative traits often considered to be “the characteristics of deaf children” usually manifest among those whose hearing parents do not use sign language [5]. Those who suffer from any degree of language deprivation are often described as “traditionally underserved”, which emphasizes the responsibility of the service community, not necessarily the individuals and their capacity [6]. This can result in difficulties with communication or social skills and later with aspects such as maintaining employment or living independently [6].

However, sign language as a natural language present in one’s environment can provide the conditions for the full development of communication and social skills [4, 5]. Furthermore, early interventions for children affected by hearing loss and their hearing families encourage more natural and genuine social relationships as well as the development of adaptive emotional skills (including self-regulation) regardless of the level of hearing loss [7]. It has also been observed that interventions, especially if received in the prelingual period, enhance emotional abilities in adolescents [7].

It has been suggested that it is not the deafness that contributes to psychiatric problems in adolescence, but the factors discussed above, such as problems in the areas of communication, health or living conditions [1, 8]. Therefore, what is crucial is not the hearing loss itself but ensuring that deaf individuals have all the development opportunities, including acquiring the skills necessary for social functioning. From the experience of social rejection and exclusion, the first language and group identification (including developing deaf identity) undoubtedly affect the development process – its social, emotional, linguistic and intellectual aspects [9, 10]; thus it is extremely important to take into consideration the characteristics of the Deaf community during the psychological assessment.

While it is always essential to consider individual differences and personal experiences, overlooking the influence of the Deaf community and deafness itself on an individual’s human development and functioning in adult

life cannot be overlooked. Furthermore, a lack of awareness of the social norms of this group or the basic characteristics of sign language might lead to the misinterpretation of some symptoms. The beliefs shared by members of the Deaf community and the way sign language differs from verbal communication will be discussed in the further sections of this article (Delusions and its specific contents and Disorganized thinking and language deprivation respectively).

These diagnostic difficulties are closely related to the lack of reliable and accessible sources for psychiatrists, psychologists and other specialists who do not have extensive knowledge of the subject matter [11]. Therefore, emphasis should be placed on how important it is to conduct more consistent and reliable research exploring mental illness in the deaf population. For now, what usually remains debatable regarding this group is not only the mechanisms underlying specific disorders but also the clinical presentation or even the diagnosis itself.

## DISORGANIZED THINKING AND LANGUAGE DEPRIVATION

While language deprivation constitutes a major risk factor for the deaf individual’s development [12], it is still experienced by many deaf children born in hearing families. Black *et al.* estimate that 75% of deaf patients hospitalized psychiatrically in the USA are not fluent in American sign language (ASL), and that 66% are not fluent in any language [13, 14]. In the assessment process, differentiating between disorganized thinking and lack of proficiency in the language can potentially be the source of difficulties, especially taking into consideration the fact that the two could co-occur. The situation becomes even more complicated when the specialist is not familiar with sign language and uses an interpreter or tries to communicate anyway, for example via writing. The content which is translated directly from sign language to words or written by a deaf individual (whose first language is different than the diagnostician’s first language) can seem fragmentary, and may encourage an unjustified diagnosis of disorganized thinking [15].

For those who are not well-versed in this field, on the surface the communication using sign language itself might resemble the symptoms of psychomotor agitation, and the facial expression which is linguistically significant and affects the meaning of a message might seem to be inadequate [16, 17]. It is worth consulting an experienced translator concerning aspects such as facial expression (is it consistent with the message and the specific communicative situation?), prosody (how fast the signing is and whether some signs are overly emphasized) and the overall impression of the speech – its coherency and fluency [11].

Deaf individuals whose communication skills are less advanced might appear to be socially withdrawn [16]

or try to use techniques such as steering away from the topic of conversation in order to distract attention away from their deficits [15]. The difficulties deriving from these kinds of deficits might generate major distress and frustration for a patient who is currently undergoing the diagnostic process (sometimes mainly due to the lack of efficient communication) but cannot communicate freely. It might negatively affect the patient's physical and mental health, hence complicating clinical presentation of presumptive mental illness.

Furthermore, deaf individuals who are not fluent in sign language tend towards experiencing difficulties regarding using and understanding complex grammatical structures as well as towards having a restricted vocabulary [11]. For this reason, Kitson and Fry point out that factors such as lack of mutual understanding between patient and diagnostician or poverty of content make it extremely complicated to differentiate deaf patients who are psychotic from those who are not [15]. Taking into account factors such as inconsistency, incoherent clarifications and overall limited contact with reality might facilitate that assessment in this respect [15].

There are many autonomous sign languages and their structure and syntax can be fully independent from the spoken language used in a given area. Due to insufficient data or research in the field, examples of symptoms of disorganized thinking which can be present in sign language come from the literature focusing on ASL – a sign language widely-used even outside North America (for example in some parts of Africa and South-East Asia).

Exhibiting tangential thinking and loose associations while becoming easily distracted might be indicative of psychosis, though not sufficient for a diagnosis that should be supported by additional evidence. One of the specific traits of speech which suggests disorganized thinking is object chaining – a tendency to sequence nouns at the end of a phrase [11]. Series of nouns in sign languages have their own meaning – in ASL sequencing, some exemplary objects could convey a broader category of objects [11]. Another symptom which signals disorganized thinking is echopraxia – an equivalent of echolalia, referring to repeating the signs of the interlocutor [11]. Clanging – using signs that are similar in shape but do not have a particular meaning – constitutes another phenomenon which is present in hearing psychotic patients and can also be found in some form in deaf patients [16]. Perseveration – illogically repeating the same signs – can also be considered as a specific symptom of disorganized thinking [16]. An equivalent of neologisms consists of merging commonly used elements of the sign language (movements and shapes) in a way that is incomprehensible for others [11]. However, it is important to differentiate neologisms and “home signs” used by the family or others in the immediate environment of an individual [16] as well as some other variants of certain signs, for example those deriving from locally used

dialects [11]. Because of that, in order to make the diagnostic process more effective it is recommended to ensure the services of a local interpreter and to verify problematic signs with people from the patient's inner circle who are fluent in sign language [11].

Hearing patients experiencing disorganized thinking usually find it difficult to benefit from contextual information. In the sign language context often determines the specific meaning of a communicate, and thus in the case of deaf individuals the manifestation of this deficit can be quite pronounced compared to others [11]. What should also be carefully considered while differentiating between delusions and the consequences of language deprivation is a noticeably impoverished vocabulary with incorrectly used signs (sometimes mixed with gestures), lack of time indicators, issues regarding sign language syntax and spatial organization of information [6]. These symptoms, accompanied by appropriate social relationships and emotional expression, might simply be the result of a low level of language skills, not necessarily of their impairment [6]. It should also be mentioned that some symptoms associated with disorganized thinking or communicative difficulties might be intricately linked to brain injury causing the hearing loss [11].

## DELUSIONS AND THEIR SPECIFIC CONTENTS

The psychological theories of delusion-formation point to the role of factors such as traumatic events, cognitive distortions or anomalies in self-experiencing [18]. When analyzing the situation of prelingually deaf individuals growing up in a non-signing family, it seems likely that they can be particularly prone to developing delusions. In the process of the formation of self-belief (including self-esteem and agency) and beliefs about the world communication is of major importance, especially in the closest environment, and the feedback received therein [19]. Not sharing a language with parents leads to distress in adolescents [20]. The consequences of such language barrier-induced distress might include feeling misunderstood or unsafe in the relationship with parents, which subsequently increases the risk of maldevelopment – in terms of the formation of a maladaptive attachment style, and later social withdrawal or the development of dysfunctional cognitive tendencies. At this point it is worth mentioning that research on the mental health of hearing-impaired children and adolescents is rarely conducted and seldom reflects on the impact made by different forms of communication and educational methods on the psychosocial adjustment of deaf children [21].

Deaf individuals' beliefs that deviate from the norm might originate from naivety or lack of supported learning [15]. What could also contribute to the formation of

maladaptive beliefs in this population is the limited access to information sources and, consequently, limited knowledge in some respects [16, 17]. At the same time, it should be emphasized that such deficits do not necessarily correspond to the IQ level – it may turn out that the delay in theory of mind development is far more significant [16, 17]. To prevent an unjustified diagnosis of delusions these factors should be differentiated from Deaf community social norms and the effects of numerous barriers experienced by deaf individuals in the course of the early stages of life.

Johnson and Xiong indicate that some beliefs and behavior presented by deaf individuals might derive from a distrust of healthcare [16]. Boness discusses the many years of history of oppression experienced by the Deaf community, especially concerning the recognition of sign language as an independent method of communication and the medicalization of deafness [22]. Not acknowledging sign language as a legitimate form of communication resulted in using spoken language in many situations such as education, which made knowledge acquisition even more difficult for deaf individuals [22]. The author points out the fact that the distrust of healthcare persists among the Deaf community, interfering with the building of strong, trust-based therapeutic relationships [22].

Forensic case studies also suggest that the association between deafness and inferiority can emerge in delusions of grandeur and relate to being singled out or underprivileged [23, 26]. It is therefore advisable to be particularly careful when it comes to distinguishing between distrust and inferiority-based beliefs from delusions. At the other end of the spectrum, without fully understanding the situation or questions asked deaf patients may try to provide a specialist with the answers they consider expected [6], consolidating false conclusions.

Furthermore, research exploring the characteristics of deaf individuals who lost their hearing after language acquisition show that this group is at risk of developing paranoid schizophrenia [16], and that the difficulties in interpersonal communication experienced after the hearing loss are thought to be one of the contributing factors [15]. On the other hand, among those patients with a cochlear implant it was the content of the delusions that seemed strongly affected by their unique experience. Case studies report how, according to delusional patients, the presence of a cochlear implant makes it possible for deaf individuals to be identified and controlled in the public space [23]. These types of delusions might originate from being rejected by Deaf community after the procedure done, as the community inclines towards perceiving speaking as oppressive or at least unnecessary and deafness as good or superior, and thus an implant can be seen as some kind of betrayal [6]. These cases can serve as examples showing the importance of acknowledging Deaf community

norms, specific deafness types and how they can all affect clinical presentation and the accuracy of a diagnosis.

## HALLUCINATIONS AND AUDITORY EXPERIENCES

Compared to other categories of symptoms, auditory hallucinations in deaf individuals are more widely researched, described, and seem to be a contentious issue. While there is a consensus that despite hearing loss patients can experience these types of hallucinations, the nature of their experience remains unclear [24].

Using sign language with no apparent recipient is among the factors which may complicate the accurate assessment of auditory hallucinations [16]. In spite of the initial impression under which the diagnostician could form a certain hypothesis, this doesn't have to be an answer to a nonexistent stimulus and thus shouldn't act as a main argument for considering symptoms to be psychotic [16]. Zimmermann suggests that self-signing can be used as an aid in problem-solving and analyzing, as well as preparing for conversations with others [25]. Considering the close associations between language and executive functions, this type of behavior seems understandable. Similar tasks are assigned to inner speech, which has not yet been explored in the population of prelingually deaf individuals. It is worth mentioning that "traditionally underserved" deaf individuals demonstrate poor problem-solving skills, low tolerance of frustration and poor emotional control [26] – characteristics attributable to executive functions which, according to Glickman, could all be rooted in a deficit of language skills. Zimmermann also notes that self-signing is usually present at an early age in the situation of feeling lonely, bored, or of auto reflecting [25]. Based on that, it seems reasonable to recognize it as an equivalent of the self-directed speech which is used by hearing children during playtime or as a self-regulation tool.

Sometimes deaf patients describing these experiences claim to hear sounds or spoken words [27]. Nowadays researchers try to explore this topic with reference to psychology, psychiatry or neuroscience. Nonetheless it is important to emphasize that most deaf individuals have some residual hearing, which is sometimes indicated as the source of their auditory experiences [11]. Older theories attributed auditory hallucinations to the profound desire to hear or to the incorrect interpretation of air vibrations [28]. However, what is currently being discussed is primarily the fact that deaf individuals who allege that they experience auditory hallucinations cannot provide diagnosticians with descriptions, including the actual characteristics of a sound such as its tone, volume and timbre of voice [16] but can match the voice to the specific person, define its emotional connotations and convey the content of the message [28]. The notion of voice itself seems to be a vital part of the dis-

cussion. Some suggest that it should be interpreted rather as a “message”, “communication” or “knowledge that something was said” than a voice in its primary meaning [28]. This approach seems consistent with deaf patients’ descriptions of “ideas entering the mind” or telepathic ways of acquiring knowledge [16]. Nevertheless, the similarity of these expressions to characteristics of delusions concerning thought insertion, which might cause further difficulties in the assessment process, should be noted.

A widely acclaimed theory which could explain the process of auditory hallucinations is the misattribution of inner speech theory. At the same time, while discussing the situation of deaf individuals it is essential to consider the nature of not only the hallucinations experienced by this group but also of their inner speech. Atkinson indicates that at the level of neural information processing sign language could simply be considered as an articulation code and subsequently be processed by working memory as such [28]. Internally generating sign language activates the left supplementary motor area, dorsolateral prefrontal cortex and the language association cortices of the temporal lobes – in line with not only the same activity performed in spoken language but also with the regions activated in patients experiencing auditory-verbal hallucinations [28]. Although it can be suggested that inner speech should not be associated with specific types of language, there is not enough reliable and holistic research exploring modalities of language other than the spoken variety.

Distinct differences between the experiences of deaf and hearing individuals may be demonstrated by analyzing perceptual feedback. In the case of hearing individuals, words spoken are perceived in the same way that the words of an interlocutor are – through hearing. In the case of deaf individuals their own statements are experienced in a way strongly associated with touch and movement, while interlocutors’ statements must be analyzed visually. Some accounts suggest the frequent experience of auditory hallucination in deaf patients; Landsberger and Diaz indicate that it would be more appropriate to use the term “sub-visual” since they are most probably connected with the ways in which communication is conducted – being as it is both generating and receiving [24]. These authors emphasize the significance of not only reading the actual signs but also techniques such as lip-reading, which are used by many deaf individuals and also require the involvement of visual perception. Lip-reading has been associated with the activation of the left superior temporal sulcus, typically responsible for integrating the auditory and visuomotor components of the perception of speech, which could influence the ambiguous nature of the hallucinations experienced by deaf individuals [28]. This approach is supported by case studies reporting on more specific types of hallucination in the population of deaf individuals – lip-reading without clearly seeing a speaker’s face, perceiving a signing hand without clearly seeing their owner [28], detecting

gestures similar to ASL signs [29], feeling that their hands unintentionally form different letters and signs, experiencing hallucinations of vibration, pressure or a bizarre sense of airflow [30].

Research points to similar characteristics of hallucinations described as auditory in both deaf and hearing individuals. The voices usually speak in second or third person, can be singular or plural, are located inside or outside of the patient’s head, are sometimes not accessible through senses, and are identified as verbal or nonverbal [30]. Deaf patients who experience auditory hallucinations are usually distracted and often found responding to a perceived voice or restlessly gazing around [6]. However, some patients view the voices as neutral or even pleasant and supportive [30]. The delusions experienced by deaf individuals can also be filled with music and barely influence their functioning and insight, especially when they do not co-occur with other symptoms such as delusions [1].

Existing research exploring musical hallucinations in deaf individuals in which the type of deafness discussed is clearly stated concerns only acquired deafness. Because of that some specialists try to point out the similarities between the auditory hallucinations of postlingually deaf patients and Charles Bonnet syndrome [1]. According to Evers and Ellger both deafness and brain injuries are associated with musical hallucinations, which are mostly observed in elderly women with no history of mental illness [31]. When analyzing cases in future it should be noted that these two factors might be connected. Murray and Jones suggest that these kinds of sensations do not necessarily constitute a risk factor for psychotic disorders [32]. It is possible that some of the types of hallucinations discussed here and experienced by deaf individuals should in fact be categorized as harmless. In line with conclusions from the research conducted by Pijmans *et al.*, what seems fundamental in the assessment process is the function of hallucinations – their meaning, the feelings evoked by them, and the consequences for individual’s functioning [33].

While discussing the issue of the modality of hallucinations is important in the sense of enhancing our understanding the symptoms’ characteristics, it is not essential to help and assist the patient. What is far more helpful is to consider whether the concept of auditory hallucinations is well understood by the patient, whether it could be mistaken for tinnitus-related experiences, and if there is more evidence of auditory hallucinations than the patient’s simple confirmation [6].

## CONCLUSIONS AND PRACTICAL ADVICE

In both therapy for and diagnosis of deaf individuals it is important to be especially mindful and sensitive when it comes to the form of communication. The fundamental issue is to guard against following once-popular misconceptions leading to the finding of pathology in the beha-

viator associated with the expressive nature of sign language or Deaf community norms. It is always vital to evaluate one's own experience and the possibility of recommending another specialist [6].

In order to make the communication, and consequently the assessment of deaf individuals more effective and stress-free, it is advisable to accept the fact that good communication with deaf patients simply takes more time than it does with hearing patients, so plan longer appointments [17] and, if necessary, include interpreters in the process before the session begins so that they become more aware of psychological terms or symptoms [24]. Since the interpreters are not typically trained to work with dysfluent individuals it is important to reach out to experienced specialists who can provide the clinician with an accurate linguistic analysis [34]. While communicating with deaf patients, it is essential to ensure that they have the best possible view of the diagnostician's face [17]. It may be helpful to use simple language, short phrases and to monitor patient's comprehension by asking them to summarize key points throughout the course of the session [17]. Providing conditions in which effective communication can take place not only makes it possible to adequately assess the disorganized thinking symptoms expressed via language but also makes further assessment more accurate. Understanding deaf patients' perspective and narratives could allow the diagnostician to accurately differentiate delusions from beliefs common in the Deaf community (such as distrust of healthcare) and to observe the way these affect the assessment situation (i.e. it is understandable for deaf patients to be agitated or nervous in contact with medical professionals if they share the belief that healthcare should not be trusted). Furthermore, effective communication facilitates

the conduct of reliable interviews concerning potential hallucinations – their characteristics, contents, emotional associations and the way they are perceived by the patient.

Unfortunately, while assessing deaf patients professionals do not have deaf-adjusted diagnostic methods at their disposal. However, it is worth mentioning that the Montreal Cognitive Assessment can serve as an example of a widely-acclaimed tool which is currently being modified for the needs of those who use a hearing aid [35]. Expanding such research could make it possible to adapt a wider range of already acclaimed assessment tools not only for patients using a hearing aid but also for deaf patients using different sign languages.

At the same time, practical advice regarding specific diagnostic issues should be based on valid, current, reliable research that can allow professionals to acquire the knowledge related to the characteristics of psychotic disorders in deaf individuals and to develop culturally and linguistically appropriate assessment tools [36]. More profound recognition and comprehension of deafness-related experiences would not only benefit the professionals but above all increase the well-being of deaf individuals suffering from psychotic disorders, as well as of those whose diagnosis still remains unclear. Communicative barriers generate frustration, unease and lack of a sense of safety, which could contribute to worsened mental health or provoke incomprehensible behavior identified as possible symptoms. Sensitivity and an adequate approach to this group of patients can profit many – patients and their well-being, professionals and their effectiveness, and the overall relationship between the Deaf community and healthcare, once full of mistrust and insecurity.

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