

Cultural Explanations of Sleep Paralysis in Italy: The *Pandafeche* Attack and Associated Supernatural Beliefs

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Abstract The current study examines cultural explanations regarding sleep paralysis (SP) in Italy. The study explores (1) whether the phenomenology of SP generates culturally specific interpretations and causal explanations and (2) what are the beliefs and local traditions associated with such cultural explanations. The participants were Italian nationals from the general population ($n = 68$) recruited in the region of Abruzzo, Italy. All participants had experienced at least one lifetime episode of SP. The sleep paralysis experiences and phenomenology questionnaire were orally administered to participants. We found a multilayered cultural interpretation of SP, namely the *Pandafeche* attack, associated with various supernatural beliefs. Thirty-eight percent of participants believed that this supernatural being, the *Pandafeche*—often referred to as an evil witch, sometimes as a ghost-like spirit or a terrifying humanoid cat—might have caused their SP. Twenty-four percent of all participants sensed the *Pandafeche* was present during their SP. Strategies to prevent *Pandafeche* attack included sleeping in supine position, placing a broom by the bedroom door, or putting a pile of sand by the bed. Case studies are presented to illustrate the study findings. The *Pandafeche* attack thus constitutes a culturally specific, supernatural interpretation of the phenomenology of SP in the Abruzzo region of Italy.

Keywords Sleep paralysis · Cultural interpretation · Causal explanation · Supernatural beliefs

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Introduction

Sleep paralysis (SP) is a psychobiological phenomenon arising from transient desynchrony in the architecture of rapid eye movement (REM) sleep (Hobson 1995). During REM sleep, where most of vivid dreaming occurs, a paralysis of skeletal muscles (atonia) prevents people from acting out their dreams (Jalal and Hinton 2013, in press). Occasionally, the perceptual and motor aspects of REM sleep decouple and the sleeper feels awake before muscle paralysis wanes (Paradis et al. 2009). The sleeper thus “feels” awake but cannot move or speak. SP is common, with lifetime prevalence rates ranging from 18 to 40 percent in the general population. While SP is a symptom of narcolepsy, the vast majority of SP episodes are unrelated to narcolepsy, and non-narcolepsy-associated sleep paralysis is often referred to as “isolated” sleep paralysis (Jalal et al. 2014b).

During SP, the perceptual activity of dreaming generated by REM sleep may become activated. Intrusion of such REM mentation into emerging wakefulness is tantamount to dreaming with one’s eyes open. These vivid sensory experiences, hypnogogic (upon falling asleep) or hypnopompic (upon awakening) hallucinations can occur in all sensory modalities. They may involve hearing footsteps, experiencing levitation and autoscapy, and seeing, hearing, and sensing the presence of menacing intruders in one’s bedroom (Cheyne et al. 1999a, b). Even the imagining of sexual molestation is not rare during SP (Jalal et al. 2014a). Unsurprisingly, people often experience great fear and terror during the episode (Hufford 1982). For example, as reported by Cheyne et al. (1999a, b), 90 % of a college student sample reported being afraid during SP. This rate of fear far exceeds what occurs in dreaming, as dreams are only frightening 30 % of the time (Schredl and Doll 1998; Sharpless and Barber 2011).

The general phenomenology of SP—being unable to speak upon falling asleep or awakening, often all the while seeing an approaching form and often feeling shortness of breath—is stable across cultures, which is due to the neurological basis of the experience (Hinton et al. 2005; Jalal et al. 2014a). Features of REM respiration, such as occlusion of airways and shallow rapid breathing, hypoxia, and hypercapnia, may lead to brain-stem-induced amygdala activation. This in turn may generate a hypervigilant state and threat bias that may explain the common evil “sensed presence” during SP (Cheyne et al. 1999a, b). Moreover, a functional disturbance in the right-parietal region (e.g., the right superior parietal lobule) due to lack of proprioceptive feedback in response to activate motor-programs may lead to a distortion in body image. This body image distortion may explain the common autoscapy, levitation, and out-of-body experiences that sometimes occur during SP, and possibly the shadow-like figure that is seen during the event (Jalal and Ramachandran 2014).

Though SP causes similar symptoms across cultures, each culture explains the paralysis and hallucinations in different ways. Supernatural interpretations of the experience are common (Bloom and Gelardin 1985; Hufford 2005). Because of the overwhelming subjective and peculiar nature of SP, some experiencers still adhere to supernatural explanations even after learning about SP’s neurological

basis (Jalal et al. 2014a). Some examples of supernatural accounts of SP transculturally include the following: in Newfoundland, “Old Hag” (Hufford 1982; Ness 1978, 1985); in Japan, *kanashibari* (i.e., demons; Arikawa et al. 1999); in China, “ghost oppression” (Wing et al. 1994); among Cambodians, “the ghost pushes you down” (Hinton et al. 2005); in the United States, sometimes space alien abduction (McNally and Clancy 2005); and in Egypt, attacks by the *Jinn* (Jalal et al. 2014a).

Jalal et al. (2014a) found that as many as 71 % of Egyptians from the general population explain SP supernaturally; and 48 % specifically believe their SP to be caused by the *Jinn*, spirit-like creature rooted in Islamic tradition (on the *Jinn*, see too, Amer and Jalal 2011). In addition, 22 % of the general Egyptian population attributes SP to the *Shaitan* (demons). Moreover, as many as 41 % of Egyptian SP experiencers resort to some type of Islamic traditional healing practice (known as *Ruqyah*), as prevention against “*Jinn* attack”. These include recitation of the *Quran* (the holy book of Islam), *Salah* (ritualistic prayer), and reciting *Quranic* verses over water and pouring it on one’s body, among other methods. SP experiencers from Egypt also commonly seek the advice of religious priests (*imams* and *sheikhs*) about their SP (Jalal et al. 2014a; Jalal and Hinton in press).

Such research exploring cultural beliefs associated with SP is important for a number of reasons. When SP is interpreted through a specific cultural filter (e.g., as a supernatural experience; see the salience hypothesis; Spanos et al. 1995), it may take on greater salience, in some cases leading to increased fear and potentially making it a traumatic event. Moreover, culturally determined fear of the experience (what one could call, “cultural fear priming”) may through escalating cycles of arousal and activation of brain-based fear systems result in more arousal and thus more SP episodes on average (Hinton et al. 2005; see too, Bell et al. 1988; Ohayon and Shapiro 2000; Paradis et al. 1997). In support of this hypothesis, high rates of SP have been found in the general population of Egypt, where the experience is associated with extreme terror and fear of impending death in 50 % of experiencers (Jalal and Hinton 2013). Likewise, extremely high rates of SP have been found among Cambodian refugees, and they have various cultural interpretations of the experience such as attributing the hallucinations to attacks by dangerous demons and the ghosts of the deceased (sometimes the ghosts of those who died horrible deaths during the Pol Pot genocide) or attributing paralysis to a “weak heart” that may suddenly stop functioning (Hinton, et al. 2005a, b).

To our knowledge, no studies to date have explored cultural explanations and beliefs of SP in Italy. In the current study, we wanted to address the following questions. To what extent has the phenomenology of SP generated cultural interpretations and causal explanations of the experience in Italy? And what are beliefs and local traditions associated with such cultural explanations?

Method

Participants

The participants were Italian nationals from the general population ($n = 68$) recruited in the region of Abruzzo¹, Italy, who had had at least one lifetime episode of SP. Abruzzo is located in the middle-eastern part of Italy, about 50 miles southeast of Rome; spanning an area of approx. 4000 sq. miles, and with a population of about 1.3 million inhabitants (for details on the region see, Abruzzo Italy 2015). Our recruitment was done in three out of the four provinces of Abruzzo, namely, Chieti, Teramo and Pescara.

Fifty-one percent (35/68) of participants were male, and participants' ages ranged from 20 to 81 years ($M = 41.0$, $SD = 17.9$), and their level of education ranged from 3 to 25 years ($M = 13.2$, $SD = 5.9$). Forty-nine percent (33/68) of participants were from an urban area, 32 % (22/68) from a suburban area, and 19 % (13/68) from a rural area.

Seventy-six percent (52/68) of participants self-identified as Christian or Catholic; 3 % (2/68) self-identified as spiritual (i.e., believing in God or a higher power but no particular religion); 1 % (1/68) as follower of the Islamic religion; and 20 % (13/68) described themselves as atheist or agnostic. Participants' level of religiosity ranged from 1 to 9 ($M = 6.1$, $SD = 2.9$); on a 10-point Likert-scale with higher scores indicating greater religiosity.

Instruments

Sleep Paralysis Experiences and Phenomenology Questionnaire

The sleep paralysis experiences and phenomenology questionnaire (SP-EPQ) designed by Jalal and Hinton (the first and last author of this publication) was administered orally to research participants by the second author of this article. The questionnaire is an elaborated version of the sleep paralysis questionnaire (SPQ), which has previously been utilized in Cambodian, Nigerian, Chinese, American, Egyptian and Danish populations (Hinton et al. 2005; Jalal et al. 2014a, b; Jalal and Hinton 2013; Ohaeri et al. 2004; Yeung et al. 2005). The SP-EPQ consists of 17 open- and close-ended items and is rendered in simple English.

The first item of the SP-EPQ reads, "Some people have had the experience upon going to sleep or awakening, when they were unable to move their arms or legs or to speak, even though they wanted to do so. Have you ever had this experience?" If participants answer affirmatively, they are asked to describe their experience. In line with our previous methodology when conducting SP research, the interviewer continues to probe the participant until it is certain that he or she has undergone a genuine SP experience and thus to avoid false positives (e.g., Jalal et al. 2014a, b;

¹ One participant was originally from Senegal, but as he spoke fluent Italian and had lived in Italy since his teens (for more than 10 years) he was not excluded from the study. Two participants were recruited in the region of Marche in the border area between Abruzzo and Marche (north of Abruzzo). Two participants originated from Sicily but were currently residing in Abruzzo.

Jalal and Hinton 2013). The questionnaire includes questions on the frequency of SP (e.g., lifetime, past year, and past month), triggers, time of occurrence, sleeping position and duration, and associated somatic sensations and emotions. It also includes items on the ideas of cause, hallucinatory experiences and cultural meaning, self-treatment and help seeking, and sources of knowledge about SP.

The SP-EPQ was translated by the second author, a native Italian speaker (Jalal et al. 2014a, b; Jalal and Hinton 2013; Ohaeri et al. 2004). To ensure that the Italian translation of the SP-EPQ was as accurate and as close to the English original as possible, a back-translation of the Italian SP-EPQ was done, which was then compared to the original English version. Any discrepancies were examined, leading to an alteration of translation.

Procedures

Participants from the general population of Italy were recruited through referrals from acquaintances, as well as through a recruitment webpage, seeking volunteers who thought they might have experienced SP, that is, “the experience upon going to sleep or awakening, when they were unable to move their arms or legs or to speak, even though they wanted to do so” (see first item of SP-EPQ). A non-random convenient sampling technique was utilized. “Snowballing” (chain referral) was utilized to increase sample size, which was done by asking participants to refer other individuals to our study (e.g., family, friends and colleagues), who similarly had experienced SP at least once in a lifetime. Participants were informed about the nature of the study and asked to participate. This study was approved by the Institutional Review Board, and all participants provided either written or oral consent (the mode of consent was optional). The SP-EPQ was orally administered to participants by the second author. Participants who had not experienced SP at least once in a lifetime were excluded from the study. The SP-EPQ usually took 20–25 min. to administer. All study participants completed the entire interview.

Results

As described below, SP was often associated with a *Pandafече* attack.² The results regarding *Pandafече* and SP for the 68 participants are presented in Table 1. Below, we discuss the results in the respective sections.

Causal Explanations of SP

Thirty-eight percent (26/68) of participants reported that their SP was possibly caused by the *Pandafече*, a supernatural creature that is part of the Italian cultural traditions. Within that 38 %, 28 % (19/68) were certain that their SP was caused by the *Pandafече*, and 10 % (7/68) thought that their SP might be caused by either the *Pandafече* or purely physical factors, such as stress, sleep problems, and

² We shall elaborate on various cultural traditions and beliefs about this creature in the sections below.

Table 1 Summary of causal beliefs, local traditions, remedies, and hallucinatory experiences pertaining to *Pandafeche* attack

Assessed domain	<i>n</i> = 68	%
Causal explanations of SP and the <i>Pandafeche</i>		
Believed SP to be possibly caused by a <i>Pandafeche</i> attack	26	38
Believed SP to be caused by a <i>Pandafeche</i> attack	19	28
SP caused by either a <i>Pandafeche</i> attack or neurophysiology	7	10
Previously believed in the <i>Pandafeche</i> causal explanation (but no longer)	6	9
Local tradition and beliefs about the <i>Pandafeche</i> :		
Knew of the <i>Pandafeche</i> causal explanation of SP	57	84
Knew the <i>Pandafeche</i> as a witch	28	41
Knew the <i>Pandafeche</i> as ghosts/spirits	6	9
Knew the <i>Pandafeche</i> as a big cat-like creature	4	6
Knew the <i>Pandafeche</i> as a dwarf-like creature	3	4
Local remedies for <i>Pandafeche</i> attack		
Knew of putting a broom bottom-up by the bedroom door	12	18
Knew of putting a pile of sand by the bed	5	7
Knew of sprinkling salt by the bed	2	3
Knew of putting crossed knives or scissors by bed	3	4
Applied remedies to prevent <i>Pandafeche</i> attack		
Put a broom bottom-up by the bedroom door	4	6
Put a pile of sand by the bed	2	3
Did not sleep in supine position	3	4
Put salt under the pillow	1	1
Put a comb at the feet of the bed	1	1
Hallucinatory experiences of the <i>Pandafeche</i>		
“Saw” the <i>Pandafeche</i> during their SP	8	12
“Saw” the <i>Pandafeche</i> in a female shape	3	4
“Saw” the <i>Pandafeche</i> in a male shape	1	1
Ascribed no gender to seen creature	4	6
“Saw” the <i>Pandafeche</i> as cat-like creature	1	1
The <i>Pandafeche</i> “sat” on their chest	2	3
The <i>Pandafeche</i> wanted to harm them	6	9
“Sensed the presence” of the <i>Pandafeche</i>	16	24

Note Percentages may add up to more than 100 % due to respondents giving multiple answers

indigestion. Five percent (4/68) of participants reported that their SP was precipitated by supernatural entities other than the *Pandafeche* such as ghosts or spirits.³ Three percent (2/68) of participants believed that their SP was caused by a

³ One such supernatural account, was a Catholic-based explanation of SP as an attack by demons who tempt their victims. One participant currently believed in this spiritual explanation; additionally two participants had previously subscribed to this causal explanation but no longer did. These participants reported that Catholic monks originally narrated this causal explanation of SP to them.

combination of supernatural forces and neurophysiological factors related to sleep, that is, they subscribed to a “dual causal interpretation of SP.”⁴ Three percent (2/68) of participants mentioned that they were currently unsure whether their SP was caused by supernatural entities or by neurophysiological factors like stress and anxiety. Fifty-two percent (35/68) of participants reported that their SP was not precipitated by a supernatural cause but rather by neurophysiological factors like fatigue, stress, anxiety, sleep problems, and/or heavy eating.⁵ One percent (1/68) did not mention any cause of their SP.

Abruzzo Cultural Traditions and Beliefs About the *Pandafeche*⁶

When asked whether they had heard a name for SP, 84 % (57/68) of the participants mentioned the *Pandafeche*. As elaborated below, within these 84 %, 41 % had heard that the *Pandafeche* was a witch, 9 % a ghost or spirit, 6 % a big cat-like creature, and 4 % a dwarf-like being.

The *Pandafeche* as a Witch

Of the 41 % (28/68) holding this belief, 8 specifically mentioned that these witches are women from the local town. Three said that the *Pandafeche* is a witch with a hole in her hand who attacks people when they sleep. Eight stated that according to local tradition, prior to initiating an attack, the *Pandafeche* puts her hand on the sleeper’s nose to see if it fits; if the hole in the *Pandafeche*’s hand fits the size of the sleeper’s nose, the creature initiates the attack (participants did not elaborate on why this is so). According to this tradition, a person can prevent a *Pandafeche* attack by not sleeping in a supine position, as the creature is thus unable to reach the sleeper’s nose.

The *Pandafeche* as a Ghost or Spirit

Of the 9 % (6/68) of participants who had heard that the *Pandafeche* is a ghost (i.e., spirits of dead people), 3 specifically mentioned that the *Pandafeche* are the souls of

⁴ Such a dual causal view of SP is also found in Egypt, Denmark, and the United States (Hufford 2005; Jalal et al. 2014a). This dual view often comes about as SP sufferers attempt to reconcile scientific and spiritual explanations of SP; for instance, by incorporating scientific explanations into their already established supernatural beliefs about the experience.

⁵ Of the participants who subscribed to neurophysiological causal explanations of their SP, 17% (6/35) reported that they had previously believed in a supernatural cause of SP, such as a *Pandafeche* attack. Moreover, 3 participants mentioned that while they believed in a “scientific” causal explanations, they had “seen” (i.e., hallucinated) the *Pandafeche* during an SP episode, and. Two other participants who believed their SP to be precipitated by neurophysiological factors “sensed the presence” of the *Pandafeche* during their SP.

⁶ There are several names for the *Pandafeche* creature, which are all variations of the word “*Pandafeche*”, but at times vary from the official Italian dialect. In our sample, we found expressions such as “*Pandafeche*”, “*Pandafecha*”, “*Pandafora*”, “*Pandafoga*”, “*Pandafiga*” and “*Pandafrica*.” In the current study, the most common pronunciation used by far was “*Pandafeche*.”

the dead returning. Another 9 % (6/68) of participants knew the *Pandafeche* as spirits (i.e., unspecified supernatural creatures); of these, 5 % (3/68) of participants mentioned that the *Pandafeche* are spirits sent by people who wish to harm them.

The Pandafeche as a Big Cat-Like Creature

Of all participants, 6 % (4/68) mentioned that the *Pandafeche* is a big humanoid black cat, that is, having a human shape and size but also cat ears and other cat-like features.

The Pandafeche as a Dwarf-Like Creature

Of the 4 % (3/68) who mentioned that the *Pandafeche* is a dwarf-like creature, 1 specifically mentioned that the *Pandafeche* is an “ugly” dwarf that bothers people while they sleep, for the sake of its own amusement; and 2 mentioned the names, “*Lauro*” and “*Scazzamurill*,” typical names for dwarf-like creatures.

Sources of Knowledge About SP and Associated Beliefs

Overall, 38 % (26/68) of participants had heard about SP and associated beliefs through their family, 15 % (10/68) had heard about SP and associated belief through their friends, and 7 % (5/68) had heard about SP and associated beliefs through various people in their community (excluding family and friends). Thirteen percent (9/68) had heard about SP and associated beliefs through both family and friends, and 22 % (15/22) through all of the above categories. In the current sample, no participants had consulted a traditional or religious healer about their SP.

Hallucinatory Experiences and the *Pandafeche*

Thirty-eight percent (26/68) of participants reported seeing a shadow or being move toward them during their SP. Ten percent (7/68), mentioned that this shadow or being sat on their chest. Moreover, of all participants, 12 % (8/68) reported having seen the *Pandafeche* during their SP.⁷ Of these participants who “saw” the *Pandafeche*, 5 % (3/68) mentioned seeing a female shape with various features and 1 % “saw” a male figure, whereas the remaining 6 % (4/68) of participants did not ascribe gender or specific features to the *Pandafeche* creature they had “seen.” Moreover, 1 % (1/68) “saw” the *Pandafeche* as a humanoid cat-like creature.

Of all participants, 3 % (2/68) mentioned that they saw the *Pandafeche* sitting on their chest during their SP, and 7 % (5/68) mentioned that the *Pandafeche* had ill intentions toward them. Also overall, 24 % (16/68) of participants reported having

⁷ As mentioned above, several participants who did not subscribe to the *Pandafeche* causal explanation of SP (but, for instance, believed exclusively in neurophysiological causal explanations) still reported to have hallucinated the *Pandafeche* creature during their SP.

“sensed the presence” of the *Pandafeche* during their SP. Of these 16 participants, 69 % (11/16) mentioned that this “presence” was evil in nature.

Within the 38 % (26/68) of the sample who mentioned the *Pandafeche* as a possible cause of their SP (19/68), 80 % (21/26) “sensed a presence” during their SP and 39 % (10/26) mentioned seeing something like a shadow, shape, or being move toward them during their SP episode.

Means Applied to Prevent SP and Treat Acute Events

General Knowledge of Preventative Cures

When asked, participants ($n = 68$) said they had heard from family, friends, and people in their community about various traditional remedies to prevent SP. Eighteen percent (12/68) of the participants mentioned putting a broom bottom-up by the bedroom door, 7 % (5/68) putting a pile of sand by the bedroom door, and 3 % (2/68) sprinkling salt by the bed. Three percent (2/68) of participants mentioned putting a scissor by the bed, and another participant asserted that one could put two crossed knives by the bed, which in turn would cut the *Pandafeche*. Two participants, or 3 % (2/68), mentioned that one could wear a cross to keep the *Pandafeche* at bay, 1 % (1/68) mentioned praying, and 1 % (1/68) keeping the lights to prevent a *Pandafeche* attack.

Actually Employed Means to Prevent SP

Out of all participants, 35 % (24/68) actually took measures to prevent SP, and of these, 38 % (9/24) applied various “non-supernatural” means, and 63 % (15/24) resorted to more “supernatural” preventive remedies. “Non-supernatural” attempts to prevent SP included sleeping on the side (2 % [2/68]); trying to wake up at the onset of SP (2 % [2/68]); adjusting bedroom lights (1 % [1/68]); drinking water after SP to prevent further episodes (1 % [1/68]); mental counting during SP (1 % [1/68]); avoiding sleeping in the afternoon (1 % [1/68]); and avoiding eating prior to sleep (2 % [2/68]). Supernatural means to prevent SP included placing a broom bottom-up by the bedroom door, 6 % (4/68); placing a pile of sand by the bed, 2 % (2/68); avoid sleeping in supine position, 4 % (3/68); sleeping with the lights turned on, 2 % (2/68); putting salt under the pillow, 1 % (1/68); and placing a comb at the feet of the bed, 1 % (1/68) to prevent a *Pandafeche* attack.^{8,9} Additional means to prevent SP included praying during the attack, 4 % (3/68); embracing a picture of the Holy Virgin Mary, 1 % (1/68); keeping a rosary under the pillow, 1 % (1/68); and embracing a crucifix, 1 % (1/68).

⁸ Supernatural means to prevent SP varied greatly and several participants applied multiple approaches.

⁹ As mentioned above, these six methods to prevent SP are part of the local cultural tradition to hinder a *Pandafeche* attack.

Case Studies: SP as a *Pandafeche* Attack

Case 1: Annalia and the “Sneaky” *Pandafeche* Witch

Annalia, who is 81 years of age, has experienced SP repeatedly throughout her life. After her first episode of SP as a child, Annalia consulted people in her community about the experience. She was told that her experience was a *Pandafeche* attack—an attack by witches and souls of dead people. The elderly women in Annalia’s city further told her that witches gather on Tuesdays and Fridays under the walnut tree, and the chief sorcerer sends them on a mission to assault people, which often resulted in *Pandafeche* attacks.

Annalia’s SP episodes initially begin with hearing noises coming from the *Pandafeche*, what she called a ghost-like witch, as it enters the house through the roof; she then hears tiny footsteps until the creature enters the bedroom and fiercely throws itself on her. The *Pandafeche* feels as a heavy weight on Annalia’s body, making her unable to move and speak, and Annalia wakes up terrified. Annalia explains that she has more *Pandafeche* attacks on Tuesdays or Fridays, which is consistent with the *Pandafeche* legend she had been told as a child.

Moreover, when Annalia was still a young girl she consulted a local physician, who told her that her experiences were attacks by ghosts, and recommended that she put salt under her pillow and cups of chamomile by the bed. Annalia took these preventive steps—including placing burning candles next to her bed—to no avail. The *Pandafeche* kept coming!

Case 2: Gianni and the Horrifying Humanoid Cat

Gianni, who is 51 years old, has experienced over 100 SP episodes in his life. During one of these SP episodes, he saw a cat-like creature (with a human size) and the shadow of its fangs raised toward him. It was a terrifying sight! He desperately tried to move but when the creature touched him, he immediately froze. When he woke up the next morning, he found a bite mark on his body.

It is not during each SP episode Gianni actually sees the aggressive and horrendous cat. For instance, during one episode, he did not see anything, but felt his bed shaking as the cat-like creature was trying to grab his feet; he, in turn, grabbed the creature and threw it against the bedroom closet; at that moment, he heard a banging of a chair and his cabinet, which sounded like a man falling backwards.

Gianni believes that the *Pandafeche* or witches are causing his SP because of his own experiences with SP. However, according to Gianni, the *Pandafeche* “blocks him,” that is, makes him unable to move or speak, while witches or the big cat-like creature jump on him and bite his body (i.e., the witches and the humanoid cat are separate creatures from the *Pandafeche* in Gianni’s view).

Gianni has tried several local remedies to prevent *Pandafeche* attack such as putting a broom bottom-up by the bedroom door, but has found them to be useless. Likewise, in the past his parents often tried putting brooms and crucifixes in his

room to prevent the attacks, but to no effect. Several people in his community has told him about witches that attack people and cause paralysis, and likewise his father used to tell him stories about having cat-like creatures attack him during his own SP.

Discussion

In the present study, we found a multifaceted cultural explanation of SP that often involved various supernatural beliefs, often those concerning a *Pandafeche* attack. A possible *Pandafeche* attack causal explanation was reported by 38 % of SP experiencers sampled from the region of Abruzzo, Italy. We were surprised to find that over a third of SP experiencers in a highly educated and industrialized country such as Italy endorsed such an interpretation of SP. The *Pandafeche* attack explanation has persisted and is very much active in the socio-cultural and personal-cognitive framework of modern day Italy; in spite of major advances in science and the spread of scientific literacy, such beliefs remain an experientially salient part of Italian culture and the local belief system, at least as assessed in the Abruzzo region.

Eighty-four percent of participants who were asked whether they knew a name for SP mentioned the *Pandafeche*. But a substantially smaller portion of experiencers, namely, 38 % of the entire sample, currently believed the supernatural creature was a possible cause of their SP. In this 38, 28 % were certain that their SP was precipitated by a *Pandafeche* attack and 10 % thought either the *Pandafeche* or neurophysiological factors had caused their SP. Of note, another 9 % of participants had previously believed in the *Pandafeche* causal view but had now adopted a “scientific view.” In addition, 5 % feared that supernatural beings other than the *Pandafeche*, such as ghosts and spirits, might be the cause of their SP.

Several participants did not believe in the creature but knew of local remedies for the *Pandafeche* attack, and a few participants even hallucinated the *Pandafeche* in spite of claiming not to believe in it. It is possible that these participants believed in an actual *Pandafeche* attack causing SP but were embarrassed to admit it given modern society’s tendency to view supernatural beliefs as myth and superstition void of objective truth. That is, some participants may be reluctant to openly endorse supernatural causal explanations, for instance, out of embarrassment, and fear of stigma.

The current findings suggest that the fear of SP was increased by beliefs about the *Pandafeche*. Though the beliefs about the *Pandafeche* varied, fear of the attack was great. By far the most common view, as mentioned by 41 % of participants, was that the *Pandafeche* is an evil witch-like creature, and some (5 %) hallucinated a “female shape.” The hallucinated *Pandafeche* was almost always perceived to have ill intentions, wishing to harm the experiencer. So similar to what have been found in other cultures, the cultural creature causing SP is often a source of distress for the sufferer, increasing the anticipatory fear, and fear during the actual event of SP (Hinton et al. 2005; Hufford 2005; Jalal et al. 2014a).

Only a few participants applied Catholic-Christian means to prevent SP such as embracing a crucifix or a picture of Virgin Mary. Few sought advice about their SP

from religious healers or authoritative figures: only one person consulted a Catholic monk. By contrast, in a study in Egypt, it was found that the overwhelming majority of SP experiencers specifically applied Islamic means to prevent SP such as recitation of versus of the Quran (Jalal et al. 2014a). It appears that SP receives little attention in Western religious traditions. In this respect, it is not surprising that participants reported most often learning about SP and associated beliefs from family (38 %) and friends (15 %).

A noteworthy detail about the *Pandafeche* witch, mentioned by several participants, was that she specifically targets those who sleep in supine position. According to this tradition, the *Pandafeche* has a hole in her hand that she puts on the sleeper's face; if the hole fits the sleeper's nose, an attack is initiated. A person can prevent a *Pandafeche* attack by not sleeping in a supine position. In fact, research suggests that sleeping in a supine position does predispose to having SP (Dahmen and Kasten 2001). This physiological reality of SP is thus likely to have helped shape this cultural tradition about the *Pandafeche*.

This study has limitations. The sample size was small, and a larger sample size would have helped provide more details about the *Pandafeche* creature and associated beliefs. Moreover, the “snowball” sampling method used in this study is likely to produce a homogenous sample. Also, it is possible that cultural beliefs about the *Pandafeche* and it causing SP may be specific to the Abruzzo region in Italy. Additionally, while the SP-EPQ used in this study has face validity, future study should assess the test–retest reliability and inter-rater reliability, and investigate the credibility, transferability, dependability, and confirmability of the study's findings.

In sum, the current study, which is the first to explore cultural explanations and beliefs of SP in Italy, found that as many as 38 % of participants believed that a supernatural creature, the *Pandafeche*, often referred to as an evil witch, sometimes as a ghost-like spirit or a terrifying humanoid cat, had possibly caused their SP. The *Pandafeche* attack constitutes a cultural interpretation of the phenomenology of SP in this part of Italy increasing fear of SP. Future studies should explore the extent to which the *Pandafeche* explanation of SP and associated beliefs exist in neighboring regions and larger Italy. And future studies should examine whether supernatural and cultural beliefs about SP and *Pandafeche* in Italy are associated with heightened fear of SP, greater symptoms of psychopathology (such as anxiety and trauma symptoms), and elevated rates of SP, creating vicious cycles of worsening (e.g., Hinton et al. 2005b; Otto et al. 2006).

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