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## **From burlesque to horror: a century of sleepwalking on the silver screen**

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## **Abstract**

*Background:* Long before being described as a disorder, sleepwalking was considered as a mysterious phenomenon inspiring artwork. From the early beginning of cinema, sleepwalkers were shown to populations, playing a crucial role in storytelling and collective knowledge.

*Objective:* We characterized how sleepwalking has been portrayed in a large number of movies from the origins of cinema to recent years.

*Methods:* Movies containing the words “sleepwalking” or “somnambulism” were searched for in International Movie Databases. Types of movies, sleepwalking characters, postures and behaviors during episodes, triggers, and suggested treatments were collected.

*Results:* Production of 87 movies and 22 cartoons portraying sleepwalkers was clustered around two peaks, in the 1910s and 2010s. Comedies predominated before 1960, and thriller/horror movies as a dominant genre after 1960. In contrast with real-life sleepwalking epidemiology, sleepwalkers are more often portrayed as women than men (and often wearing a transparent white nightgown), as adults more than children on-screen, and 23% suffered psychiatric comorbidities. The unrealistic posture of outstretched arms and eyes closed was found in 20% of movies and 79% of cartoons. Night terrors, sexsomnias (kissing, having sex, initiated pregnancy), sleep-related eating and sleep driving were also featured. Homicides and falls while sleepwalking were recurrent fear-inducing topics. The first sleep EEG was featured in a sleepwalking movie in 1985, and a sleep specialist gave his first advice in 1997.

*Discussion:* The representation of sleepwalking on the screen seems to have evolved from popular, unrealistic stereotypes of somnambulism towards a medical condition, paralleling the development of sleep medicine.

**Key-words:** sleepwalking; somnambulism; parasomnia; movie; cinema; film

“Somnambulism, noctambulism, there are a lot of names for that. No cure. Good night”  
in *Without love* (H.S. Bucquet, 1945)

## 1. Introduction

Somnambulism (or sleepwalking) is a parasomnia ~~of~~ primarily emerging from N3 sleep. Patients open their eyes, may sit in bed, speak (and answer questions), stand up, quietly walk and manipulate objects or on the contrary run out of bed in great distress, in a form often mixed with sleep terrors in adults [1]. However, this apparently awake behavior is accompanied by inappropriate or absent responsiveness to other’s efforts to intervene, mental confusion and a partial, retrograde amnesia [2, 3]. The mental content associated with the behavior is rarely reported, and contains usually a brief visual scene (often a misfortune), which is congruent with the observed behavior [4, 5]. Sleepwalking episodes are often reported to sleep specialists by the family or by the sleepwalker as retrospective tales resembling film scenarios. In video-polysomnography (using infrared video and audio recording, leading to black and white video recordings), wandering is rare, whereas behavioral episodes are often restricted to repeated but brief confusional arousal behaviors emerging from N3 (patients open their eyes, look around, stare, speak, and sometimes sit and look confused) [1, 6]. Sleepwalking episodes can also be captured via home video with real-life lengthy video recordings [7].

Before being described as an arousal disorder, sleepwalking was long considered a mysterious phenomenon, inspiring fictional production. The sleepwalker is a recurrent figure in literature, from German romanticism in the late 18<sup>th</sup> century (e.g., Von Kleist in *The Prince of Hombourg*) to the end of 19<sup>th</sup> century (e.g., Poe, Gautier, de Maupassant, Meyrinck), when witchcraft and supernatural events were still attributed to superstitions. During this period, natural somnambulism was differentiated from the magnetic somnambulism (also named hypnosis, mesmerism and animal magnetism), popularized from the late 18<sup>th</sup> century as a trance status induced by a an external person [8]. This fascinating character was also present in many theater plays and operas, including two emblematic female characters, i.e., Amina in *La Somnambula* from Bellini (1831), and Lady Macbeth represented as guilty with bloodied hands in *Macbeth* from Verdi (1846), based on Shakespeare’s tragedy (1623) [9, 10]. Later, the popular conception of witches and ghost-like phantoms wandering at night was gradually enlightened by more rational explanations. From a mystical approach [11], sleepwalking gained a psychoanalytic aura at the end of the 19<sup>th</sup> century, when the subconscious was considered responsible for sleepwalkers’ actions [12, 13].

At the beginning of the 20<sup>th</sup> century, film became a new powerful and popular artistic medium, in which sleepwalking was viewed as resulting from or being related to hypnotism or

mesmerism. Cinema reaches large numbers of individuals, and plays a crucial role in storytelling, in creating compelling visual representations and in contributing to collective imagination. Movies have often portrayed characters with dramatic or misunderstood conditions, including psychological, psychiatric and neurological disorders (e.g., epilepsy, coma). From the very first representations, sleepwalking has been portrayed in many movie genres including dramas, comedies and cartoons, thus attaining an audience of various ages. Previous studies have investigated how cinema portrayed epilepsy [14], coma [15], and rapid eye movement sleep behavior disorder (RBD) in Disney movies [16], but no research (to our knowledge) has yet investigated how sleepwalking has been represented as a condition throughout cinematic history.

How a given disease is portrayed in movies provides a snapshot of the popular representation of a disease in a given period. The depiction can be accurate, or may on the contrary convey an unrealistic representation, thus affecting how a medical condition is understood, possibly creating and maintaining biases and stereotypes. Here, we aimed at characterizing the depiction of sleepwalking in movies over a century, from its early origins to 2019, categorizing the films, identifying differential diagnoses, describing the sleepwalkers' characters, identifying predisposing factors, priming and precipitating episodes, timing, postures (especially popular representations) and behaviors during episodes, as well as the clinical management of sleepwalkers. By characterizing and describing how various key aspects of sleepwalking, including behavioral, psychological and treatment facets are depicted across a century, we aimed at drawing parallels with common and evolving societal conceptions of the disorder, as well as comparing and contrasting these observations with current medical knowledge of the disorder.

## **2. Methods**

### ***2.1 Selection of movies***

Movies were identified via multiple searches. The terms “sleepwalking” (French: “somnambulisme”), “somnambulism” and “sleepwalker” (French: “somnambule”) were used as keywords in major internet-based movie databases International Movie Database (IMDb, <https://www.imdb.com>) and Rotten Tomatoes (<http://rottentomatoes.com>), as well as on the English and French-language versions of the Wikipedia website ([fr.wikipedia.org](http://fr.wikipedia.org)), Senscritique ([www.senscritique.com](http://www.senscritique.com)) and Vodkaster ([www.vodkaster.com](http://www.vodkaster.com)). We also performed a search on national film catalogues in French, English, German, Spanish, Italian, Russian and Korean. Movies were then classified into fantasy, comedy, drama, thriller and

horror according to their main category. They were categorized as black-and-white or colored, and as silent or sound feature films. Movies including the words “sleepwalking” and “sleepwalkers” in the title, but not portraying any sleepwalking character were excluded from the analyses. The number of cartoons and episodes in TV shows representing sleepwalking episodes was high, potentially biasing the analysis. They were therefore not included, but, because of their great interest, a pool of cartoons (N = 21) was studied in a qualitative fashion, and the representation of sleepwalking was compared in stories geared towards children and the elderly. All available movies were viewed for information extraction. If a movie was not available for viewing (e.g., old movies), it was excluded from analyses except when the script or an exhaustive summary was available (e.g., online, French National Library).

## ***2.2. Collection of information***

The release date and country where the movies were produced are shown in Table 1. Two independent scorers (MAD and RT) determined if sleepwalking was the main topic, a pivotal or an anecdotal scene of the movie. Several features were considered, including number of scenes representing a sleepwalker and sleepwalker characteristics (nationality, gender, age category, psychiatric comorbidities, and family history of arousal disorders). Based on the complete scenario and script, two sleep specialists (MAD and IA) identified whether sleepwalking corresponded to natural somnambulism (apparently authentic cases of sleepwalking), SRDD magnetic (hypnosis-induced trance) or feigned (malingering) somnambulism. Interscorer concordance was 100%. The location (indoor or outdoor, in bed or not) and timing (nighttime or daytime, or exact timing when explicit) of the sleepwalking episode were collected by MAD and IA. The behavior of the sleepwalker was characterized by observing the eyes (closed or open) and arm posture (outstretched or not). We categorized whether the behavior was quiet or agitated, what actions the sleepwalker performed (ordinary or unusual), how the episodes ended (full awakening, going back to bed accompanied or not by someone) and if the behavior was dangerous for themselves and for others. We evaluated sleep mentation associated with the episode (dream, nightmare) and whether the sleepwalkers recalled their behavior afterwards. The occurrence of other sleep comorbidities (sleep talking, sleep terror, sleep-related eating behavior and sexsomnia) and triggering factors (stress, psychotrauma, sleep deprivation, alcohol intake) as well as fantasy causes (ghost possession) were described. In terms of clinical management, we noted whether a medical doctor, psychiatrist, psychologist, psychoanalyst or another caregiver was involved and if the sleepwalkers received any advice, drugs or other therapy.

### ***2.3. Statistical analysis***

Most information was reported as number and percentages. Between-groups differences (e.g., percentage of movies featuring sleepwalking as humorous before and after 1960, or featuring sleepwalking episodes with eye closed vs. open) were compared using a Fisher test.

## **3. Results**

### ***3.1 Film selection***

In the following section the name of the director was reported only for the first occurrence or to distinguish movies with homonymous titles. We found 93 movies using the searching words, but excluded 6 that did not feature any sleepwalking episode. Among the 87 movies featuring sleepwalking characters from 1903 to 2019, 42 (31%) mentioned the term “sleepwalking” or “sleepwalk” in the title. The movies were produced in the USA (N = 39), France (N = 15), Canada (N = 4), Germany (N = 4), Italy (N = 4), UK (N = 3), Spain (N = 2), whereas only one movie was produced in Australia, Brazil, Belgium, Columbia, China, South Korea, India, Norway, Portugal, Russia, Sweden, Switzerland, Venezuela, or Yugoslavia. One movie involved a collaboration between France and Portugal, and one other stemmed from a collaboration between France and Canada. The histogram of movies showed two main peaks of production, in the 1910-1919 and 2010-2019 decades (Figure 1). Thirty-one movies were silent movies and 56 included sound. The movies were shot in color (N = 52, 59.8%) and black-and-white (N = 35, 40.2%). Main genres included comedy (N = 30, 34.5%), drama (N = 20, 23%), horror (N = 18, 20.7%), thriller (N = 14, 16.1%), fantasy (N = 3, 3.4%) and two (2.3%) movies were considered as experimental. Movies associated with positive emotional valence (e.g., comedy) were more often released prior to (N = 26/43; 61%) rather than after 1960 (N = 6/44; 14%,  $P < 0.001$ ). An opposite pattern was observed for movies associated with negative emotional valence (e.g., thriller, horror), including 38% released prior to and 80% after 1960 ( $P < 0.001$ ). Sleepwalking was the main topic in 60/87 (69%) movies, played an important role in 14 (16%) movies and was anecdotal in 13 (15%) movies. There were 1 (in 53 movies) to 6 sleepwalking episodes per film. Overall, 153 sleepwalking episodes were analyzed. Sixty-five movies were fully viewed, and in the remaining 22 movies, an exhaustive summary or script was available (leading to some missing data for the exact description of the sleepwalker).

### ***3.2 Characteristics of sleepwalker characters***

Most movies featured a unique sleepwalking character, except for 5 movies. In the final scene of *Carmela é una Bambola* (Puccini, 1958), for example, all women in town pretend to sleepwalk. In *Slumber* (Hopkins, 2017), a whole family of sleepwalkers is portrayed and the sleep specialist in charge of the family, who sleepwalks too, has a brother who died sleepwalking as a child. Among the 82 films featuring unique sleepwalkers, 29 (35.4%) are men and 53 (64.6%) are women. Sleepwalkers are mainly adults (N = 73) and include young adults (N = 49), of uncertain but adult age (N = 37), middle age (N = 11), and old age (N = 1). More rarely, children (N = 12) and adolescents (N = 4) are depicted. The familial component of sleepwalking was present in 3 movies. In *Boniface sleepwalker* (Labro, 1951), the sleepwalker is featured with his children, all sleepwalking on a roof, including the baby sleeping with outstretched arms in his pram (Figure 2). In *Half Angel* (Sale, 1951), the father reveals to his daughter that her mother was a sleepwalker too. In *The Sleepwalker Killing* (Cosgrove, 2004), family history of sleepwalking is used by the expert in the criminal inquiry as evidence for a sleepwalking case. In *Slumber* (2017), the sleepwalking family aspect is represented as a familial evil possession. Sleepwalkers with co-occurring psychiatric symptoms (preexisting or appearing during the movie) were found in 20 (23%), movies including anxiety (N = 4), depression (N = 3), but also posttraumatic stress disorder, maniac or psychotic disorder, and addiction (sex addiction, toxicomania).

### **3.3 Differential diagnoses of sleepwalking**

Somnambulism appears to be a genuine condition in 58/87 (66.6%) movies. The sleepwalking episode occurs within a dream in two feature films (*Casey dreams that he's a sleepwalker*, 1904; *Sleepwalker* by Runeborg, 2000). Some cases of depicted sleepwalking, however, met the criteria of differential diagnoses. These include sleep-related dissociative disorders (SRDD, N = 16), malingering (N = 7), REM sleep behavior disorder and parasomnia overlap disorder (N = 1), automatism-amnesia syndrome (triggered by use of psychotropic drugs, mainly benzodiazepines and z drugs, N = 5), post-traumatic sleep disorder with parasomnia (not found), and sleep-related hyperkinetic epilepsy (not found).

#### **3.3.1 Sleep-related (psychogenic) dissociative disorders**

SRDD are parasomnia mimics with violent behaviors (often associated with self-mutilations). They emerge from well-established wakefulness, are observed during daytime, and often (92%) occur in a context of abuse or other trauma [17]. In movies, several sleepwalking scenes may meet these criteria, including hypnotic-induced ambulation and behaviors as well as behaviors

triggered by evil possession, displaying amnesic victims wandering at night. In 5 movies, sleepwalking episodes are due to “magnetic” somnambulism or to the sleepwalker being in a hypnotic trance. The character of a “psychic sleepwalker” is represented in *Eloi wants to learn to swim* (Carré, 1910), *The sleepwalking hussar* (1910) and *Penard is superstitious* (1912). In *Nick Winter and the somnambulist thief* (Gorieux, 1911), the daughter’s character is a sleepwalking thief under hypnotic influence, similar to *The cabinet of doctor Caligari* by Wiene (1920) where Cesare, a music-hall actor, kills individuals after having been hypnotized by Doctor Caligari (Figure 2). Apart from hypnosis-induced behaviors, other elements also suggest SRDD in movies. In *City of Pirates* (1984), the wandering character only has episodes during daytime (one leading her to murder), suggestive of SRDD. The concept of being “possessed” or under the influence of an evil character is portrayed in several films, mostly within the horror genre. The series of Dracula movies, including *Nosferatu* (1922), *Dracula* (1931), *Count Dracula* (1970) and *Nosferatu the Vampyre* (1979), portray women wandering during the night under the influence of Dracula. In *Neel Kamal* (1968), the main female character is called on by her former, deceased lover during wandering episodes. In *Poltergeist* (1982), paranormal ghosts manipulate a young girl wandering during the night. In *Silent hill* (2006), the ghost of a dead woman calls on a wandering girl. In *Sleepwalker* (2012), the character wandering during the night is possessed by the ghost of his grand-mother (who was a witch), and has during daytime personality disorders. In *The conjuring* (2013), a young girl who hits her head while night walking is possessed by the house ghost. In *Honeymoon* (2014), a naked female character is found wandering in the forest during the night, whereas it is later suggested in the movie that she had been attracted by a strange moving light. In *Slumber* (2017), an evil spirit possesses the character depicting the son and manipulates the whole family to the point that they all night walk. In *Sleepwalker* (2017), a sleepwalking woman also has daytime amnesia and lapses suggestive of a dissociative state. In *Good manners* (2018), a woman wandering at night is pregnant with a werewolf, and exhibits blood thirst during the full moon. In *Brightburn* (2019), the evil extraterrestrial main character levitates, sleep talks and displays violent behaviors.

### 3.3.2 Malingering

Feigned sleepwalking is featured in 7 movies, often related to a specific purpose (romance, masking a crime, avoiding school or making fun of a true sleepwalker). In *Bébé sleepwalker* (1911), the young boy simulates sleepwalking to avoid school. In *Boirot sleepwalker* (1915), the character feigns a sleepwalking episode during a collective hypnosis session, and takes this opportunity to slap the men and kiss the women. In the *Haunted house* (1928), *Don’t look*

*now...we're being shot at!* (1966) and *Somnambulism and chloroform* (1915), the main male character feigns a sleepwalking episode in order to go into his girlfriend's room. In *Arsene Lupin* (1932), two cases coexist, one with true and one with feigned sleepwalking. In *Side effect* (2013) the female character simulates depression to be prescribed antidepressant drug Ablixa (after reading that the drug could trigger sleepwalking), then masquerades as a sleepwalker and kills her husband, with the aim of being later declared not guilty.

### 3.3.3 Drug- or substance-induced automatism-amnesia syndrome

It can be difficult to distinguish drug-induced automatism-amnesia syndrome from a genuine sleepwalking condition in which the drug triggered or prolonged the episode and associated confusion. This is the case for alcohol, *Halcium* (an unknown drug) in *Sleepwalker* by Runeborg (2000), as well as drugs or poison given by husbands to their wives as in *Sleep my love* (1948) and *I'm so excited* (2013).

### 3.3.4 REM sleep behavior disorder

In movies, RBD was not found, but this may be due to a selection bias as we selected patients who walk during the night, whereas individuals with RBD rarely walk during RBD episodes unless they suffer from a parasomnia overlap disorder. Interestingly, in *Sleepwalk with me* (2017), the director and main character Mike Birbiglia portrays a medical doctor explaining that he suffers from an RBD condition (because he enacts mostly detailed nightmares), despite his young age of 30, wandering with eyes half closed, knocking on doors, jumping out the window, climbing on a piece of furniture (he dreams of standing on a podium), going in the bathroom and taking a shower, all behaviors which are more typical of sleepwalking than of RBD. However, at the end of the movie, he treats his condition by sleeping in a sleeping bag with mittens so he is unable to open the sleeping bag, and is then depicted as kicking and punching, lying down and with eyes closed, more similar to a RBD episode and suggestive of parasomnia overlap disorder.

### 3.3.5 Other differential diagnoses

We were unable to locate any sleep hyperkinetic epilepsy which may have been depicted as sleepwalking. Additionally, although some sleepwalkers started to sleepwalk after a traumatic event (e.g., in *La Sirga*, 2012 where the main character sleepwalks after her village was burnt), we could not find any behavioral events during the night that reproduced these traumatic events in any of the movies.

### ***3.4 Location and timing of the sleepwalking episodes***

At the beginning of the episode, characters are usually asleep in their bed (or alternatively in a coach, plane seat, or coffin), or they are already standing in their bedroom (N = 50). In 46 scenes, the sleepwalker sleeps before the episode begins. Then, the sleepwalker goes out through the house door or a window (N = 52), walks on a roof (N = 11), and enters the neighbor's or a stranger's house (N = 21). Episodes take place in a context of romance (N = 10), robbery (N = 5) or murder (N = 6). The sleepwalker walks downtown (N = 13) or in a natural environment (N = 14, e.g., a forest in *The Prince of Homburg* by Bellocchio, in 1997, or a cemetery in the *Count Dracula* and *In my sleep*). The episode usually occurs during the night, except in 5 atypical cases. For example, in *Caught in the rain* (Chaplin, 1914), a woman sleepwalks in a hotel during daytime and is found sitting on a vagrant's bed. In *High and dizzy* (Lloyd, 1920), the character sleepwalks on a cornice. While male sleepwalkers wear underwear or pajamas, female sleepwalkers regularly wear a white nightgown (N = 25), often transparent. Both men and women are barefoot. Two female sleepwalkers, including Lady Macbeth in *Macbeth* (Polanski, 1971) and Carol in *A lizard on a woman skin* (Fuci, 1976) are fully naked. The timing of the episode was apparent in 11 movies (visible on a clock or overtly mentioned by characters), including 4 episodes beginning during the first third of the night, 7 in the middle (2 to 5 AM) of the night and only one episode during morning awakening.

### ***3.5 Sleepwalking posture, eyes and gaze***

In most cases (N = 52/65, 80%), arms are down, in a neutral posture, often with a loss of passive dangling (Figure 2A). In other cases, the film director portrays the popular representation of sleepwalking with outstretched arms (N = 13, 20%), more often observed in comedies (N = 9) than in drama/horror movies (N = 4). Hands may be raised vertically, horizontal or downwards (Figure 2B). In sleepwalkers with outstretched arms, the rigid outstretched position is loosened when sleepwalkers open a door or use their hands to perform an action. Some characters stop the outstretched arm posture when they resume walking. Eyes are open when sleepwalking in 58/65 (89.2%) movies, closed in 6 (9.2%) movies and half-closed in one (1.5%) movie (Figure 2B). In movies where eyes are clearly focused on, sleepwalkers stare wide-eyed, as in *The Cabinet of Doctor Caligari* (1920, Figure 3) or present an empty gaze (as in *Phenomena*, in 1985, Figure 2B).

### ***3.6 Behaviors during the parasomnia episodes***

Parasomnia behaviors are most often quiet (N = 57/65). Eight episodes are mixed (quiet and agitated). In *Step Brothers* (2008), two sleepwalking brothers violently throw their father from the stairs. In *The cabinet of doctor Caligari* (1920), Cesare the sleepwalker is generally calm, except when he attempts to kill a resistant young lady. Lady Macbeth starts with a quiet sleepwalking episode and ends with shouting and crying in *Macbeth* (Wells, 1948; Polanski, 1971). In one sleepwalking episode in *Sleepwalk with me* (2012), the sleepwalker kicks a basket with his foot. Gestures are atypical (robot-like movements) in most silent movies and in some more recent movies (e.g., in *Step Brothers*, 2008; *Eddy, the sleepwalking cannibal* by Rodriguez, 2012). Clumsy or incongruous behavior is sometimes depicted (in *Step Brothers*, one places their mother's purse in the fridge while the other places a pillow in the oven) in contrast with accurate gestures in other cases (a character climbing a ladder, walking on a tightrope, stealing jewelry, or firing a gun). Sleep driving is observed in four instances, as in *The Sleepwalker killing* (1997), when one character realizes during his trial that he had been driving asleep for 40 miles and in *Sleepwalker* (Runneborg, 2000), when the hero drives under the influence of alcohol and drugs. Four sleepwalkers sing while sleeping, including Lady Macbeth who hums to herself (Welles, 1948). In *Sleepwalker* (Hochet, 2016), the sleepwalking girl sings ("Mr Sandman, bring me a dream") before slitting her throat, and in *Slumber* (2017), children sleep-sing in the dark. Other odd behaviors include committing a robbery (N = 11), holding a candle in their hand (N = 5), hiding in a cupboard (N = 1), getting married (N = 1), housekeeping (N = 1), filling a basket with ashes and throwing them on a bed (N = 1), getting dressed (N = 1), dancing (N = 1), and swimming (N = 1). Most often, the episode ends when the sleepwalkers go back to bed, spontaneously or gently guided by someone else. They awake naturally or are awakened by someone else (police, director of the school, friend, dog). In a few instances, the sleepwalkers suddenly get up due to feeling pain, falling from the bed, bumping into an object, falling in water, being burned by hot water in the shower, or because they see a light source (train headlights, flashlight).

### **3.7 Night terrors, sexsomnia, sleep-related eating disorder and sleep talking**

Night terrors are associated with sleepwalking in 6 movies, typically presented as a sleepwalker with raised chest and shouting, as in *Nosferatu* (Murnau, 1922). Parasomnia episodes including sexsomnia are encountered in 12 movies. Kissing (a spouse, stranger, neighbor or statue) is observed in 9 out of 12 movies. A female character has an orgasm while having an erotic dream in *A lizard in a woman skin* (Fulci, 1971), and is later suspected to have committed a crime while sleepwalking. In *Benilde or the virgin mother* (De Olivera, 1974), the main female

character is pregnant but is unable to recall sexual intercourse. In *Sleepwalking in Suburbia* (Wright, 2017), Michelle walks to the parental bedroom of her neighbors, kisses the female neighbor, has sex with the male neighbor and gets pregnant. In *In my sleep* (2010), a male character has sex with his wife's best friend. A scene of parasomniac fellatio takes place in a plane in *I'm so excited* (2013). In *Good manners* (2018), the female lead has a engages in sensual acts with her housemaid while sleeping.

Five parasomnia episodes were associated with amnestic eating, drinking or preparing food. They included setting the table for breakfast in the middle of the night in *Side effects* (2013), cooking with entire eggs (shells included) in *Slumber* (2017), and switching on the stove and heating some milk in *Sleepwalking in Suburbia* (2017). In *Good manners* (2018), a pregnant mother eats raw meat in large quantities from the fridge and devours a cat, and in *Eddy the sleepwalking cannibal* (2012), sleepwalking episodes are associated with cannibalism.

Sleep talking is noted in 17 movies, most often including mumbles, but a few sleepwalkers speak with clear voices and meaningful sentences, sometimes aggressively. For example, in *Nosferatu* (1922), Nina shouts "Jonathan! Jonathan! Listen to me! I must go and meet him", and Lady Macbeth confesses her crime (Welles, 1948). In *Neel Kamal* (Maheshawari, 1968), the sleepwalking heroine answers to the lover from her past life: "No, no. Don't touch me, don't touch me". In *Poltergeist* (Hopper, 1982), the little girl dialogues with maleficent evils from the TV. In *Sleepwalker* (Hochet, 2016), the sleepwalker shouts "Simon, you're just an asshole", mumbles and then says "No, no, stop, don't touch me". Sleepwalkers laugh with an evil laugh in *Macbeth* (Welles, 1948), *Slumber* (2017) and *City of pirates* (1984).

### ***3.8 Sleep mentation associated with sleepwalking episodes***

Several sleepwalkers recognize having had a nightmare on the next morning, often a recurring nightmare (N = 14). Some characters explicitly mention that they had a dream (N = 6). Eventually, dream walking is suggested by a physician to explain the sleepwalking episodes (e.g., in *Heidi*, by Comencini in 1952: "She dreams of her mountains"). In *Sleepwalk with me* (2012), a dream or nightmare is depicted in most sleepwalking episodes. Usually, sleepwalkers have no recollection of the episodes. For instance, they ask where they are. There are two exceptions. In *The sleepwalker killing* (1997), the sleepwalker remembers his mother-in-law's face (as he killed her during the episode) and the feeling that his children were in danger. In *Slumber* (2017), the father engages in violent behavior against a doctor, thinking or dreaming that she will hurt his children.

### **3.9 Triggers**

Main triggers depicted explicitly or implicitly include stress, sleep debt and substance intake (alcohol, drug) during the preceding days (Table 2). Drug names seem to refer to common medications, including Halcium (probably Halcion®) and Ablixa (probably Eblixa®). Snoring and sleep apnea, which have been mentioned as triggers of sleepwalking, were not encountered before or during human sleepwalking in movies, and no obese sleepwalkers were depicted. In contrast, humans and animals (dog, bear, mouse, duck, sheep) sleepwalking in 13/22 cartoons snored (possibly as a mean to depict the fact that they were sleeping) and some continued to snore during the sleepwalking episode (e.g., Mickey Mouse snored during sleepwalking). However, no apnea or crescendo snoring (suggestive of hypopnea) as triggers of sleepwalking were found.

### **3.10 Consequences of sleepwalking episodes on the screen**

In several movies, the sleepwalking episode is associated with injuries to oneself, including pseudo-suicide which results in death in three movies (Table 3). More frequently, sleepwalkers are placed at high risk of falling or injuring themselves due to misuse of objects. In general, the sleepwalkers do not hurt themselves, are prevented from hurting or protected at the last minute by intervening individuals. Sleepwalkers injure or kill (N = 8) or attempt to murder (N = 3) other characters. Murder suspicion is featured in five additional movies. The social consequences of sleepwalking include being excluded (from school, army or navy or from their family), imprisoned, placed in an asylum, and exposed to mockery. Personal consequences include feeling ashamed and developing insomnia. Positive consequences of sleepwalking are also featured, including falling in love (N = 4), catching burglars (*Pimple's Midnight Ramble* by Evans, 1903), saving a child from a lofty window edge (*The sleepwalker* by Le Saint, 1922), as well as capturing the real criminal and becoming a hero (*Early to bed* by McLeod, 1936).

### **3.11 Medical management**

Clinicians are generally medical doctors (N = 15), sleep specialists (N = 7; first appearing as experts in *The Sleepwalker killing* in 1997), psychiatrists (N = 2), psychoanalysts (N = 2), psychologists (N = 3) or a gynecologist and even a demonologist. A medical lesson on sleepwalking is sometimes given, which can be considered mostly accurate, according to diagnostic criteria, however the idea that the subconscious is responsible for the behavior is frequently observed. The idea that one should not wake up sleepwalkers because it could kill them is frequent. In *Phenomena* (1985), Jessica benefits from an electroencephalography,

whereas in 5 other movies a video-polysomnography is performed. Most of the time, the doctor analyzes live polysomnography during the night. Some counterstrategies are suggested and implemented by the sleepwalkers or their family, including drugs (benzodiazepines and some unspecified medicines), mechanical disposals to protect the sleeper as well as prevent ambulation and wandering, and suggestions to follow the repressed desires of the sleepwalker (Table 4). Most doctors recommend resting, avoiding stress, and supervising the sleeper.

### **3.12. Sleepwalking in cartoons**

Twenty-two cartoons were investigated (starting from *Popeye: A Dream Walking*, from the Fleischer Studios in 1934). Twelve cartoons feature a sleepwalking animal, including two dogs (Pluto and Goofy), a bear, a sheep, two ducks (Donald duck and a duck in *The Tom and Jerry show*), Woody Woodpecker, Bugs Bunny, the horse Spark Plug, a ram, a snail and an undetermined animal. Eyes are more often closed in cartoons (19/21 [90%]) than in movies (6/65 [9%],  $P < 0.0001$ ). Sleepwalkers in 16/21 (76%) cartoons more often present outstretched arms than in 13/65 (20%) movies ( $P < 0.0001$ ). Incongruous and extraordinary actions include tightrope walking ( $N = 6$ ), climbing (building, trees), walking on the ceiling, eating a house (in *A Hoss Kin Dream*), opening the lock of a prison door, running away from prison, opening a safe ( $N = 2$ ) (in the *Daltons*), wearing a boot as a hat (in *Donald Duck*), walking with a bucket on the head, building a tunnel ( $N = 2$  as in *Woody Woodpecker*), placing video tapes as dominoes, putting a dog on small cars, destroying a museum, eating jewelry (in the *Simpsons*), sleep eating ( $N = 4$ ), and kissing ( $N = 2$ ). Dangerous behaviors include sleep driving, walking on a ceiling, climbing, tightrope walking, balancing at the top of a cliff, setting one's bed on fire (*Inspector Gadget*), falling, risking of being robbed or eaten (being in a lion's cage, at the enemy's mercy, as in *Tom & Jerry*), drowning, being manipulated by children (*Simpsons*), and being run over by a car.

## **4. Discussion**

### **4.1. From burlesque to tragedy and horror**

The production of the 87 movies (and 21 cartoons) portraying sleepwalkers from the onset of motion picture production in 1900 to 2019 had two peaks, in the 1910s and 2010s. One third of movies featuring sleepwalkers belong are comedies, predominantly before (51%) than after (14%) 1960, especially during the burlesque movie era (before World War I). During this period, the public was fascinated by duality and unconscious automatisms of the body.

Experimental psychology, hysteria and neurological cases pictured by Charcot and Gilles de la Tourette, as well as psychiatric theories gave the Parisian cabaret and early film comedy a new repertoire of movements, grimaces, tics and gestures [18]. It should be noted that silent movies first took place in fairs, between phantasmagoric shows, exhibits of individuals with physical diseases, hypnosis sessions (including more or less rigged psychic experiences) and other shows, making sleepwalking on the screen a particularly famous topic. In comedies and cartoons, sleepwalking seems to inspire directors as an archetypical way to use the mechanisms of laughter analyzed by Bergson [19], including absent-minded characteristics (e.g., wearing a hat combined with pajamas or eating jewelry), incongruous and graceless movements, rigid facial features, and socially awkward behaviors (e.g., walking outside in pajamas). The fact that most sleepwalkers do not speak but display facial emotions also make them suitable for the silent cinema and cartoons.

These laugh-inducing sleepwalkers become less present after 1960, when sleepwalking is more often represented as a medical disorder or a frightening topic in dramas, thrillers and horror movies. Indeed, what makes us laugh can also evoke fear, using bizarreness and stiffness as similar emotion triggers. The power of violence in sleepwalkers evolves over the course of the century with a more frequent negative depiction, from a “worrying strangeness” feeling to the character of the “murderer sleepwalker” and the “possessed sleepwalker”, which is not genuine sleepwalking but rather a sleep-related dissociative disorder [17]. This character was featured on screen early on by the iconic character of Cesare the sleepwalker in *The Cabinet of Dr Caligari* (1920), considered as the first horror movie in history, at a time when séances and paranormal beliefs were influent [20]. The cinematographic motifs of the *mise-en-scene* aimed at inducing dread are recurrently used. Episodes begin at nighttime and often convey a thrilling atmosphere created by a silent, dark setting and a dim source of light, often used to induce typical jump scare effects (e.g., creaking of a door, or a sleepwalker suddenly appearing in a white nightdress as a ghost). Dangerous sleepwalking behaviors, including homicide, falls and even cannibalism are recurrent frightening topics. The sudden change of personality of the sleepwalkers (especially when they are family members) to the point of being out of control (suggesting evil possession, double personality, and schizophrenia) and the change in facial expression (bugling eyes) may recall transformation into a monster. Similarities can be found in these films between sleepwalkers, who are between wakefulness and sleep, and the walking dead and zombies, who are between life and death.

Apart from these amusing and frightening aspects, a more poetic approach of directors is to portray sleepwalkers as dreamers escaping their daily fate during the night, in a show of

freedom. The *Prince of Hamburg* sleepwalks to escape facing war. In *When father goes away on business*, the little boy sleepwalks to escape his parent's fights. *Neel Kamal* walks during the night when called on by her forbidden love. Here, the implicit mechanism used by the directors is the psychoanalytic concept that one would express a resurgence of repressed (hate or love) instincts through dreams (in this case enacted).

#### ***4.2 The epidemiology of sleepwalking on the silver screen***

In accordance with the epidemiology of adult sleepwalking in the general population [21, 22] and in hospital cohorts [23-25], sleepwalking characters in movies are mostly young adults. Surprisingly, children with sleepwalking are quite rarely portrayed in movies, whereas sleepwalking is more frequent in children than in adults in epidemiology [3].

There is a predominance (two thirds) of women in sleepwalking movies, when nocturnal wandering equally affects men and women in epidemiological studies [22]. The director may have chosen to portray women in movies as an opportunity to show female bodies eroticized in white, transparent nightgowns, or to illustrate female "vulnerability". A similar trend towards portraying affected women more than men is observed in the representation of epilepsy in movies [14].

Surprisingly, familial cases of arousal disorders are rare (3%) on the silver screen, whereas a family history is reported by one third of subjects in epidemiology [22] and in half of patients in hospital series [23]. As many as 23% of sleepwalker characters have psychopathologic comorbidities in movies, in contrast with the majority of adult sleepwalkers having no significant psychopathology [26]. This representation may illustrate the common (and false) belief that somnambulism has a psychopathologic background or can be a symptom of a psychiatric disease. Alternatively, it may be the director's choice to render the character's personality more fearful and complex.

#### ***4.3 Semiology of behaviors***

In movies, sleepwalking episodes occur more often the middle of the night and exceptionally the morning, whereas in medical exploration, the main episode most often occurs in the first third of the night. Filming in complete darkness is impossible, unless one uses an infrared light as in sleep laboratories. To circumvent this problem, the *Day for night* procedure has been in use since silent movies. It consists in filming during the day using an underexposed film or by darkening the film during post-production with a blue tint.

The main triggers of episodes in the movies considered (explicitly reported in 26% movies) correspond to those found in the medical literature, including stress conditions during the previous days, sleep debt, alcohol, as well as drug or substance intake [23, 24, 27, 28]. Self-injuries, pseudo-suicide and high risk of falling are often portrayed, and injuries (or risk of injuries) to others and even homicide are found in 11 movies. In contrast to documented medical cases [29, 30], there is no rape committed by sleepwalkers in movies portraying sexsomnia (although it is implicitly suggested in two movies that the sleepwalking woman has been raped) but some sleepwalkers do enter someone else's bed.

#### ***4.4 Misdiagnosis of sleepwalking***

As many as one third of movies picturing so-called sleepwalking episodes did not fulfill the criteria of genuine, medical sleepwalking [2], but rather illustrated differential diagnoses. The most frequent misdiagnosis was SRDD or psychogenic parasomnia, which could apply by proxy to magnetic- or hypnosis-induced amnesic behaviors and to nocturnal behaviors as ghost possessions. In both instances, the nightwalkers did not act on their own will, but instead had their mind controlled by another entity. This serves an artistic purpose, whereas genuine SRDD may occur in patients with a psychiatric neurotic condition, often attracting the attention of families and physicians by “possession-like” behaviors (large body, shoulder and hip movements with closed eyes when lying in bed, despite being awake) [17]. One may wonder in these cases whether on-screen portrayals of ghost possessions may influence these behaviors. Malingering (masqueraded sleepwalking) was pictured in around 10% of movies, mostly for masking love or murder purposes. In these cases, the director clearly indicated to the audience that sleepwalking was feigned. REM sleep behavior disorder corresponds to enacted dreams in REM sleep by lack of normal muscle atonia, and is easily distinguished from sleepwalking in movies because it usually affects elderly, who have their eye closed, fight in their bed and do not wander [31]. Despite sleepwalkers sometimes reporting brief (and rarely more complex) visual dream contents, as well as enactments of the content of these N3 dreams and nightmares [4, 32-34] as patients with REM sleep behavior disorder are prone to doing, this notion that one “dream walks” is quite recent in sleep medicine (as is the idea that one does dream in N3 and not only in REM sleep), to the point that some physicians may still mistake dream/sleep walking with REM sleep behavior disorder. Mike Birbiglia's 2017 film (*Sleepwalk with me*), who as a director depicts his own case, seeks medical advice, and eventually receives the diagnosis of RBD instead of sleepwalking (against compelling evidences that he sleepwalks), is an interesting illustration of this false belief.

**4.5 The outstretched arms and closed eyes posture** As many as 20% of movies and 76% of cartoons portray sleepwalkers with outstretched arms. This feature corresponds to the popular representation of sleepwalking, as displayed in several works of art [11], including paintings (*The sleepwalker* by Mucha, 1885; *The sleepwalking dancer* by Von Resnicek, 1906), sculptures (*The sleepwalker* by de Miller, 1983; *The sleepwalker* by Matelli, 2014; *The sleepwalkers* by Sechas, 2002), ballets (*The night shadow* by Balanchine, 1946; *Café Müller*, by Bausch, 1978) and theatre plays. Arms are stiffly held out or outstretched laterally. Hands may be raised up vertically, horizontally or downwards. The origin of this tonic arm posture is unknown. One may speculate that it shares similarities with the posture of blind persons protecting themselves from being hurt when walking, hence there is a certain coherence in associating outstretched arms and closed eyes. Alternatively, it may be a contamination of the posture used by hypnotists in the beginning of the 20<sup>th</sup> century. In a common representation, they induce magnetic somnambulism (hypnotic trance) by sending a fluid through their outstretched hands. In the recent field of medical hypnosis, hypnotherapists do not “send” something with their hand, but they do use a subject’s arm stiffness to induce and verify the hypnotic state, as described in most suggestibility and induction scales [35]. Of interest, zombies in movies have outstretched arms, but their hands are placed in a catching position with fingers spread, as if wanting to grab people [36]. In the script of the movie *I Walked With the Zombie* by J. Tourneur (1943), zombie wandering is described as “A white-robed female figure comes out from under the stairs, walking slowly, her movements drift-like as if walking in deep sleep”, illustrating some commonalities between zombies and sleepwalkers. From a practical, directors’ point of view, the outstretched arm posture has the major visual advantage that the public to easily recognizes that a character is sleepwalking.

Beside this unrealistic posture, robot-like, saccadic movements are also portrayed in movies featuring sleepwalking, more often in comedies, in sharp contrast with fluid movements in medical sleepwalking [37]. Here, one may notice the similarity with movements of mechanic automatons and dolls, first created by de Vaucanson in 18<sup>th</sup> century [38]. In addition to posture, an abnormal, saccadic behavior may also help the spectator identify the affected character. In 9% of movies and 90% of cartoons, sleepwalkers are represented with eyes closed. Although medical sleepwalkers have eyes open, especially when walking [1, 7], it seems that Shakespeare was better informed in 1606 than contemporary film-makers: in the sleepwalking scene in *Macbeth*, the doctor claims that “Her eyes are open but she cannot see”. However, as

well as above, closed eyes may be used as a cinematographic visual signature depicting that a character is asleep.

#### **4.6. General conclusion**

Although it spans a century, this series of movies is certainly not exhaustive, and mostly limited to Western movies released in the United States and Europe. For a few movies, we only found scripts (some 1900-1910 movies had been lost), leading to incomplete information. These two limitations being acknowledged, this work brings several new findings. Within one century, sleepwalking on the silver screen has progressively evolved from burlesque presentation (the caricature being a young beautiful woman dressed in a transparent white nightgown, wandering with eyes closed and outstretched arms) towards a dangerous and sometimes medical presentation, possibly mirroring medical research on sleepwalking with some delay. In popular culture, sleepwalking is not considered as a disease and is often a neglected condition. Consequently, directors can still afford to freely deal with this topic and use parody and stereotypes, whereas they would not easily caricature a stroke or Parkinson's disease in their movies.

The development of an accurate medicalization (now featuring sleep laboratories, polysomnography, and medical advices, including forensic expertise) on screen helps to consider sleepwalking as an established sleep disorder. Film exerts a huge power on collective imagination, but as with any artwork, it does not necessarily need to make a true-to-life portrait. Directors may choose to represent unrealistic forms of somnambulism, as part of their creative art. On the other hand, popularizing false stereotypes can have deleterious effects. Directors could benefit from the advice of sleep specialists if their purpose is to portray a real disease. Conversely, educational programs including several emblematic movies may enhance the clinical proficiency of future physicians in sleep disorders semiology.

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**Table 1- Movies with depicted sleepwalking**

<b>Title</b>	<b>Director</b>	<b>Year</b>	<b>Country</b>	<b>Genre</b>
The somnambulist	A. Collins	1903	USA	Fantasy
Casey dreams that he's a sleepwalker	E.S. Porter	1904	USA	Fantasy
The greedy girl	L. Fitzhamon	1908	UK	Fantasy
The somnambulist crime	A.E. Coleby	1908	UK	Thriller
The sleepwalker	T. Bouwmeester	1909	USA	Thriller
The sleepwalking hussar [Le hussard somnambule]*	Pathé Frères	1910	France	Comedy
Eloi wants to learn to swim [Eloi veut apprendre à nager]*	M. Carré	1910	France	Comedy
Nick Winter and the somnambulist thief [Nick Winter, la voleuse et la somnambule]	R. Gorieux	1911	France	Comedy
The sleepwalker	V.D. Brooke	1911	USA	Comedy
Bébé sleepwalker [Bébé somnambule]*	L. Feuillade	1911	France	Comedy
Pénard is superstitious [Pénard est superstitieux]*	Pathé Films	1912	France	Comedy
The lost necklace	Pathé Films	1912	USA	Drama
A night of peril	B. Haldan	1912	USA	Drama
The maid is a sleepwalker [La bonne est somnambule]*	Pathé Frères	1913	France	Comedy
Jean's evidence	L. Trimble	1913	USA	Drama
Pimple's midnight ramble	J. Evans	1913	USA	Comedy
Caught in the rain	C. Chaplin	1914	USA	Comedy
The mystery of Mr Marks	W. Buckland	1914	UK	Thriller
Boireau sleepwalker [Boireau somnambule]*	A. Deed	1915	France	Comedy
Somnambulism and chloroform [Somnambulisme et chloroforme]*	L. Cazalis	1915	France	Comedy
The fatal ring	G. Brackett Seitz	1918	USA	Thriller
The doll [Die puppe]	E. Lubitsch	1919	Germany	Comedy
High and dizzy	H. Lloyd	1920	USA	Comedy
The cabinet of Dr. Caligari [Das cabinet des Dr. Caligari]	R. Wiene	1920	Germany	Horror
The sleepwalker	E. LeSaint	1922	USA	Drama
Nosferatu [Nosferatu: eine Symphonie des Grauens]	F.W. Murnau	1922	Germany	Horror
The gay retreat	B. Stoloff	1928	USA	Comedy
The haunted house	B. Christensen	1928	USA	Comedy
The pearl [La perle]*	H. d'Ursel	1929	Belgium	Comedy
Dracula	T. Browning	1931	USA	Horror
Arsene Lupin	J. Conway	1932	USA	Comedy
Zero for conduct [Zéro de conduite]	J. Vigo	1933	France	Comedy
Sing, Sister, Sing	J. Parrott	1935	USA	Comedy
Early to bed	N.Z. McLeod	1936	USA	Thriller
A very young lady	H.D. Schuster	1941	USA	Comedy
Without love	H.S. Bucquet	1945	USA	Comedy
Sleep my love	D. Sirk	1948	USA	Thriller
Macbeth	O. Welles	1948	USA	Drama
The sleepwalker [Boniface somnambule]	M. Labro	1951	France	Comedy
Ensemble for somnambulists	M. Deren	1951	USA	Experimental
Half angel	R. Sale	1951	USA	Comedy
Heidi	L. Comencini	1952	Swiss	Drama
Carmela is a doll [Carmela è una bambola]	G. Puccini	1958	Italia	Comedy
Viridiana	L. Bunuel	1961	Spain	Drama
Don't look now... We're being shot at! [La grande vadrouille]	G. Oury	1966	France	Comedy
Neel Kamal	R. Maheshwari	1968	India	Drama
Count Dracula	J. Franco	1970	USA	Horror
A lizard in a woman's skin [Una lucertola con la pelle di donna]	L. Fulci	1971	Italia	Thriller
Macbeth	R. Polanski	1971	USA	Drama
Benilde or the virgin mother [Benilde ou a virgem mãe]	M. de Oliveira	1974	Portugal	Drama
Nosferatu the vampyre	W. Herzog	1979	Germany	Horror
Poltergeist	T. Hooper	1982	USA	Horror
City of pirates [La ville des pirates]	R. Ruiz	1984	F-Portugal	Drama
Sleepwalker	S. Logan	1984	USA	Horror
When father was away on business [Otac na službenom putu]	E. Kusturica	1985	Yugoslavia	Drama

Creepers [Phenomena]	D. Argento	1985	Italia	Horror
The sleepwalker killing	J. Cosgrove	1997	USA	Drama
The prince of Homburg	M. Bellochio	1997	Italia	Drama
Sleepwalker	J. Runeborg	2000	Sweden	Thriller
Donnie Darko	R. Kelly	2001	USA	Horror
An adventure [Une aventure]*	X. Giannoli	2005	France	Drama
Silent hill	C. Gans	2006	F-Canadian	Horror
My Winnipeg	G. Maddin	2007	Canada	Drama
Stepbrothers	A. McKay	2008	USA	Comedy
Caligari and the sleepwalker	J. Tellez	2008	Venezuela	Experimental
Dream [Bi-Mong]	K. Ki Duk	2008	S. Korea	Thriller
In my sleep	A. Wolf	2010	USA	Thriller
Sleepwalker in 3D [夢遊 3D]	O. Pang	2011	China	Thriller
Eddie, the sleepwalking cannibal	B. Rodriguez	2012	Canada	Horror
Sleepwalker [Сомнамбула]	A. Iakovlev	2012	Russia	Thriller
The towrope [La sirga]	W. Vega	2012	Colombia	Drama
Side effects	S. Soderbergh	2013	USA	Thriller
The conjuring	J. Wan	2013	USA	Horror
I'm so excited [Los amantes pasajeros]	P. Almodovar	2013	Spain	Comedy
The sleepwalker	M. Fastvold	2014	Norway	Drama
Honeymoon	L. Janiak	2014	USA	Horror
Sleepwalker [Somnambule]*	T. Hochet	2016	France	Drama
Marie and the castaways [Marie et les naufragés]*	S. Betbeder	2016	France	Comedy
Sleepwalk with me	M. Birbiglia	2017	USA	Comedy
Sleepwalker	S. Loch	2017	Australia	Horror
Sleepwalker	E. Lester	2017	USA	Thriller
Sleepwalking in Suburbia	A. Wright	2017	Canada	Drama
Slumber	J. Hopkins	2017	USA	Horror
Sleepwalker	A. Cooley	2017	Canada	Horror
Love standing up [L'Amour debout]*	M. Dacheux	2018	France	Comedy
Good manners [As boas maneiras]	J. Rojas	2018	Brazil	Horror
Brightburn	D. Yavoresky	2019	USA	Horror

F: France, S: South; [original title]

**Table 2 - Triggers of the depicted sleepwalking episodes in movies**

<b>Trigger</b>	<b>Movies</b>
<b>Stress</b>	
Her fiancé is in danger	<i>Nosferatu (1922)</i>
Remorse	<i>Macbeth (1948)</i>
Nostalgia	<i>Heidi (1952)</i>
Perspective of getting married	<i>Half Angel (1951); Carmela é una bambola (1958)</i>
Parents quarrel	<i>When father was away on business (1985)</i>
Gambling debts	<i>The sleepwalker killing (1997)</i>
Anxiety	<i>Sleepwalker by Runeborg (2000)</i>
Divorce	<i>Dream (2008)</i>
Post-traumatic stress (her village was burnt)	<i>The Towrope (2012)</i>
Husband sent to jail, stress after a marital dispute	<i>Side effects (2013)</i>
Honeymoon trip	<i>Honeymoon (2014)</i>
Love break	<i>Sleepwalker by Hochet (2016)</i>
Pregnancy attempts after a miscarriage	<i>Sleepwalking in suburbia (2017)</i>
<b>Sleep deprivation</b>	
Slept in the sofa, bad sleep	<i>The sleepwalker killing (1997)</i>
Shift work	<i>Marie and the castaways (2016)</i>
Several short nights due to his job	<i>Sleepwalk with me (2017)</i>
<b>Alcohol, drugs and substances intake</b>	
Alcohol	<i>Casey dreams that he is a sleepwalker (1904)</i>
A powder poured by her husband in a chocolate cup	<i>Sleep my love (1948)</i>
Hypnotic pills given by her husband	<i>I'm so excited (2013)</i>
Ablixa, an antidepressant prescribed by a psychiatrist	<i>Side effects (2013)</i>
A combination of alcohol and Halcium	<i>Sleepwalker by Runeborg (2000)</i>
Mundane alcohol intake	<i>Sleepwalker by Logan (1984)</i>

**Table 3 : Consequences of the depicted sleepwalking**

<b>Consequences</b>	<b>Movies</b>
<b>Death</b> Falling from roof, slits his throat	<i>The mystery of Mr. Marks (1914); Sleepwalker (2016); Slumber (2017)</i>
<b>Self-injury</b> Falling, car accident, self-mutilation, bangs her head	<i>The somnambulist (1903); Casey dreams that he is a sleepwalker (1904); A very young lady (1941); An adventure (2005); Sleepwalker (2012); The conjuring (2013); Sleepwalk with me (2017)</i>
<b>Risk of self-injury:</b> Risk of falling when they step or jump over the window, walk or run on guardrail, roofs, or along a cliff, risk of being crashed on railways, of having an accident when sleep driving	<i>The maid is a sleepwalker (1913); The doll (1919); High and dizzy (1920); Nosferatu (1922; 1979); The pearl (1929); A dream walking (1934); Sing sister sing (1935); A very young lady (1941); Sleep my love (1948); Boniface sleepwalker (1951); Carmela is a doll (1958); Neel Kamal (1968); City of pirates (1984); When father was away on business (1985); Phenomena (1985); Donnie Darko (2001); Silent hill (2006); Dream (2008); In my sleep (2010); Marie and the castaways (2016); Sleepwalker (2017, by Loch); Sleepwalker (2017, by Leister); Love standing up (2018); Good manners (2018)</i>
<b>Homicide</b> Strangulation, stabbing, gun fire	<i>The mystery of Mr. Marks (1914); The Cabinet of Dr Caligari (1920); City of pirates (1984); Sleepwalker (1984); The Sleepwalker Killing (1997); An adventure (2005); Eddie the sleepwalking cannibal (2012); Side effects (2013); Brightburn (2019)</i>
<b>Risk of homicide or injury</b> Holds a gun or a knife	<i>The sleepwalking hussar (1910); Sleep my love (1948); Viridiana (1961); Sleepwalker (2000); Stepbrothers (2008); Slumber (2017); Good manners (2018)</i>
<b>Suspicion of homicide</b>	<i>A lizard in a woman skin (1971); Dream (2008); In my sleep (2010); Sleepwalker in 3D (2011); Sleepwalker (2016)</i>
<b>Amnestic sensual or sexual behavior</b> Kisses, sensual relation, fellatio, orgasm, rape, suspected rape, amnestic intercourse	<i>Half angel (1951); The sleepwalker (1951); Carmela is a doll (1958); Count Dracula (1970); Lizard in a woman skin (1971); Benilde or the virgin mother (1974); In my sleep (2010); I'm so excited (2013); Honeymoon (2014); Marie and the castaways (2016); Sleepwalking in suburbia (2017); Good manners (2018)</i>
<b>Eating inedible food</b>	<i>Eddie the sleepwalking cannibal (2012); Good manners (2018)</i>

Raw meat, a cat, humans

***Exclusion***

from school

*Bébé sleepwalker (1911); Phenomena (1985)*

from army

*The gay retreat (1928)*

from their family

*Neel Kamal (1968); Benilde or the virgin mother (1974)*

***Placed in jail***

*The sleepwalking hussar (1910)*

***Placed in asylum***

*Phenomena (1985)*

***Abducted***

*A night of peril (1912); The sleepwalker (1909); Dracula (1931)*

***Shame and mockery***

*Bébé sleepwalker (1911); Phenomena (1985); Neel Kamal (1968);*

*Donnie Darco (2001); Sleepwalking in Suburbia (2017)*

***Accusation of theft***

*The Sleepwalker (1911)*

***Insomnia***

*Half Angel (1951); Marie and the castaways (2016)*

***Became a hero***

*Pimple's midnight ramble (1913); The Sleepwalker (1922); Early to bed (1936)*

***Found love***

*Arsene Lupin (1932); Carmela is a doll (1958); Half Angel (1961);*

*Don't look now... We're being shot at! (1966)*

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**Table 4 – Management of depicted sleepwalking suggested in movies**

<b>Treatment</b>	<b>Counsellor</b>	<b>Beneficial</b>	<b>Movie</b>
<b><i>Drugs and calming substances</i></b>			
Calming plants, rest	Physician	No	<i>Sleep my love (1948)</i>
Medicine bottle	Physician	No	<i>Neel Kamal (1968)</i>
Pills	Sleep specialist	No	<i>The Sleepwalker killing (1997)</i>
Pills (for associated hallucinations)	Psychiatrist	No	<i>Donnie Darko (2001)</i>
Pills	Psychiatrist	No	<i>Side effects (2013)</i>
Pills (in the evening)	Sleep specialist	No	<i>In my sleep (2010)</i>
Goat milk before sleep	Her uncle	Unknown	<i>La Sirga (2012)</i>
Anxiolytics	Gynecologist	No	<i>Good manners (2018)</i>
<b><i>Mechanical protections and disposals against ambulation</i></b>			
Door blocked with furniture, upper bed protected with ribbons, asks his dog to watch	Personal treatment	No	<i>Without Love (1945)</i>
Bell on the wrist	His parents	No	<i>When father was away on business (1985)</i>
Coffee and loud music (to avoid sleep), a water bucket on the door	Personal treatment	No	<i>Half Angel (1951)</i>
Tacks on the floor	Family, friends	No	<i>Carmela e una bambola (1955)</i>
“Always keep an eye on her”	Physician	No	<i>Neel Kamal (1968)</i>
“Don’t let her sleep alone”	Physician	No	<i>Phenomena (1985)</i>
Handcuffed to her partner	Unknow	Unknown	<i>Dream (2008)</i>
Handcuffed to bed, door blocked with a chair	Personal treatment	No	<i>In my sleep (2010)</i>
Nail planks to the window	His roommate	No	<i>Eddie the sleepwalking cannibal (2012)</i>
Door blocked with a chair	Personal treatment	No	<i>Sleepwalker by E. Lester (2017)</i>
Handcuffed to bed	Personal treatment	No	<i>Sleepwalking in Suburbia (2017)</i>
Puts a second locker on the door	Sleep specialist	No	<i>Sleepwalker by E. Lester (2017)</i>
Sleeping in a sleeping bag with mitten to avoid opening the zipper	Personal	Unknown	<i>Sleepwalk with me (2017)</i>
<b><i>One should follow the repressed desire of the sleepwalker</i></b>			
Gift of four fox dogs	Specialist MD	Yes	<i>Qui a tué?(1926)</i>
“Only God can do something to her”	Family MD	Unknown	<i>Macbeth (1948)</i>
Returning her home mountains	Family MD	Yes	<i>Heidi (1952)</i>
Calm, getting married, having children	Physician	No	<i>Neel Kamal (1968)</i>
Go with her in the place mentioned during her episode	Her parents	No	<i>Silent hill (2006)</i>
“Love! It will never stop until you will be together”	Psychologist	Unknown	<i>Dream (2008)</i>
Kills the evil that lives in him	Psychologist	No	<i>Sleepwalker (Russian, 2012)</i>

**Supplementary Table – List of 22 cartoons featuring human and animal sleepwalkers**

<b>Title</b>	<b>Director</b>	<b>Year</b>	<b>Country</b>
Popeye the sailorman: "A dream walking"	Fleischer Studios	1934	USA
Pluto: "The Sleepwalker"	Studio Disney	1942	USA
Merrie Melodies: "The Unbearable Bear"	L.S. Studios	1943	USA
Donald Duck: "Sleepy Time Donald"	Disney Studios	1947	USA
Looney Tunes: "Water, water every hare"	C. Jones	1952	USA
Snuffy Smith and Barney Google: "A Hoss Kin Dream"	Paramount Cartoon Studios	1964	USA
Looney Tunes: "Skyscraper Caper"	A. Lovy	1968	USA
Popeye: "Popeye the sleepwalker"	G. Gordon	1978	USA
Bolek and Lolek: "Lolek sleepwalker" [Bolek i Lolek: "Lolek lunatyk"]*	W. Nehrebeck	1980	Poland
Inspector Gadget: "Bad dreams are made of this"	A. Heyward	1986	USA
The Woody Woodpecker show: "Sleepwalking Woody"	W. Lantz	1999	USA
The Simpsons: "Crook and Ladder"	L. Kramer	2007	USA
Shaun the sheep: "Sheepwalking"	J.P. Vine	2007	USA
[Titeuf : « La Bouriflette somnambulique »]	C. Choquet	2008	France
Ed, Edd n Eddy: "Sleepwalking Ed"	D. Antonucci	2009	USA
The Daltons: "Averell, are you sleeping?" [Les Daltons: "Averell, tu dors?"]*	C. Vaucelle	2010	France
Smeshariki: "the sleepwalker"	I. Maximov	2010	Russia
Crime time: "Sleepwalker"	K. Christides	2011	USA
Donald Duck: "Sleepwalkin'"	Disney Studios	2013	USA
Adventure time: "The vault"	N. Cash	2013	USA
The sleepwalker [Sonámbulo]	T. Ushev	2015	Canada
The Tom and Jerry show: "Sleepwalking Duck"	J. Praytor	2017	USA

## **Legend of the figures**

**Figure 1** - Histogram of movies featuring sleepwalkers across time, per decade (from 1903 to 2020). Positive (comedy, in green) and negative (drama, thriller, horror, in dashed brown) emotional movies

**Figure 2** - Sleepwalkers postures in movies. Upper panel: Jennifer sleepwalking in *Phenomena*, by D. Argento (1985), ©Ronald Grant Archive / Alamy Stock Photo. Lower panel: Boniface and his children (familial sleepwalking), with upstretched arms in *The sleepwalker* by M. Labro (1951), © Ronald Grant Archive / Alamy Stock Photo.

**Figure 3** - Sleepwalker featured with wide open eyes: Cesare, in *The cabinet of Doctor Caligari* by R. Wiene (1920), © United Archives GmbH / Alamy Stock Photo.