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Living happily ever after? The hidden health risks of Disney princesses

While much current research on Disney princesses focuses on the harmful impact of unrealistic ideals on young viewers' self-esteem, there is a critical need to shift attention towards the health risks faced by the princesses themselves, **Sanne H B van Dijk and colleagues** argue

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Fairytales princesses continue to be widely celebrated. The Walt Disney Company has undoubtedly contributed to their popularity by producing movies based on these stories. While these films captivate young viewers, they also raise concerns about stereotyping.¹ Unrealistic portrayals of relationships, as well as impossible beauty standards such as unnatural waist-to-hip ratios,² can negatively impact girls' self-esteem.³ To date, research has focused on the films' effects on viewers' health, neglecting to explore the health risks faced by the princesses themselves. Future research must consider threats to the health of Disney princesses.

Disney princesses face serious real world health hazards. Surprisingly, however, despite these risks they seem to live happily ever after. Disney must consider interventions to overcome these health challenges. Strategies to improve princesses' wellbeing could include mindfulness and psychotherapy, training on cohabitation with animals, and personal protection measures against infectious agents and toxic particles. Only then can Disney princesses start living healthily ever after.

Snow White, *Snow White and the Seven Dwarfs*

Snow White is the first and fairest princess of all (according to the mirror on the wall), charming audiences with her timeless appeal. As a scullery maid for her wicked stepmother, opportunities for social interaction are extremely limited. An overview of systematic reviews finds a strong positive association between lack of social interaction and cardiovascular disease, depression, anxiety, and all cause mortality.⁴ Fortunately, Snow White meets the Seven Dwarfs, who protect her from the dangers of solitude. Subsequently, however, Snow White eats a poisoned apple which puts her in a "sleeping death." This outcome highlights that, for Snow White, the saying "an apple a day keeps the doctor away" fails spectacularly.

Jasmine, *Aladdin*

Jasmine grows up within the walls of her palace in Agrabah—with the royal staff, guards, and princes who ask for her hand in marriage providing her only social interaction. This exposes her to the risks of social isolation, similar to Snow White. Additionally, while the Genie might sing "you ain't never had a friend like me," the truth is that Jasmine has no friends at all. Research shows that loneliness is associated with dementia, mental health problems

(such as depression and anxiety), and dysregulation of the immune system.⁵⁻⁷ Furthermore, Jasmine's pet tiger Rajah poses a risk of zoonotic infection,^{8,9} as well as craniofacial and cervical spinal injuries.^{10,11} Although Rajah seems like a sweet tiger, its natural instincts could lead to a dangerous and potentially fatal situation^{10,12,13}—a true Arabian nightmare.

Cinderella

Cinderella had a happy childhood, until her father died and left her with a cold hearted stepmother and two spoil stepsisters. From that point on, Cinderella is forced to run the household, continuous exposure to dust putting her at risk of developing occupational lung disease (OLD).¹⁴ Researchers recommend several preventive measures to reduce dust exposure, such as using long broom handles, sprinkling water on dusty floors, and personal protective equipment,¹⁴ none of which are adopted in Cinderella's case. Chimney sweeping also poses a risk of OLD and lung cancer, potentially leading to an early death.¹⁵ When things could not get worse—bibi-bidi-bobbidi-boo!—Cinderella's fairy godmother puts the icing on the cake by spreading massive quantities of magical glitter—otherwise known as aluminium coated microplastics. These microplastics' ability to penetrate human lung tissue¹⁶ contributes further to OLD development.¹⁷ Rather than a prince, Cinderella needs ongoing respiratory therapy to live happily ever after.

Pocahontas

Pocahontas' drive to bring peace between Native Americans and English settlers takes her on adventures to dizzying heights—literally. Her cliff dive has an impressive falling time of nine seconds. Based on the falling time, we estimated the height of the cliff through simulations using coupled differential equations for height and velocity with quadratic drag. Assuming average female anthropomorphic measurements (62 kg,¹⁸ 1.62 m height,¹⁹ 0.36 m shoulder width¹⁹), and standard environmental constants (drag coefficient of 1.0, gravitational acceleration of 9.81 m/s², and air density of 1.2 kg/m³), the cliff height was estimated at 252 m. Studies on slamming dynamics of diving suggest that hand first dives from heights above merely 12 m could already be critical for clavicular compressions.²⁰ Hence, a repeat leap would show Pocahontas the monochromatic hues of her x rays instead of the *Colours of the Wind*, with a symphony of fractures rather than a harmonious tune with nature.

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Aurora, *Sleeping Beauty*

After Maleficent bewitches her as a newborn, Aurora is raised by her three fairy godmothers in a cozy cabin in the woods. After 16 years, she returns to the castle where she pricks her finger on an enchanted spinning wheel's spindle, putting her into an infinite sleep—she can only be woken by true love's kiss. Health hazards associated with oversleeping include cardiovascular disease, stroke, obesity, and diabetes.²¹ Furthermore, systematic reviews have shown that prolonged bed rest is associated with increased risk of pressure ulcers²² and time dependent muscle atrophy.²³ Luckily, Prince Philip almost immediately breaks the sleeping spell by kissing Aurora, though he also breaks with current social norms by neglecting to obtain consent. Since Aurora awakes after a short nap, perhaps the movie's title should be *Beauty Sleep* rather than *Sleeping Beauty*.

Mulan

While Mulan is celebrated as a warrior who saves the empire of China, a story of deeply rooted familial and societal pressure lies beneath. Mulan repeatedly experiences honour based violence²⁴ through pressure from her family to uphold their honour with an arranged marriage, a public serenade summoning her to bring honour to all, and public defamation by the Matchmaker and the Emperor's counsel. Women facing honour based violence may experience increased levels of mental ill health²⁵—such as in the form of anxiety from being forced into living a life they did not choose.²⁶ Luckily, Mulan can rely on her guardian dragon Mushu for words of encouragement. His attempts at consoling her are arguably lacking therapeutic efficacy, however. “Who knew you'd end up shamin' him [Mulan's father] and disgracing your ancestors and losin' all your friends?” he asks. In our opinion, *A Girl Worth Fighting For* deserves better.

Belle, *Beauty and the Beast*

When her father is taken prisoner by the Beast and locked in a castle dungeon, Belle comes to the rescue. To free her father, she offers herself as a captive, and the Beast accepts. How severely does this threaten Belle's health? What even is a beast? Well, this Beast has a buffalo head with gorilla eyebrows, a wild boar's tusks, the mane of a lion, the arms and body of a bear, and a wolf's legs and tail.²⁷ The Beast is thus a chimera, an entity composed of cells of different organisms.²⁸ Close contact with the Beast exposes Belle to many potentially life threatening infectious diseases, such as brucellosis²⁹ or rabies.³⁰ However, had Belle chosen the Beast's rival in love, Gaston—a narcissist with an ego so inflated it is practically a third character—it would probably have had a worse impact on her mental health.³¹ Despite obvious risks the advice is: better the Beast you know.

Rapunzel, *Tangled*

Rapunzel is widely known for her long, blonde, braided hair. She is taken captive as a baby by Mother Gothel—Gothel uses Rapunzel's hair as a magical anti-ageing serum. Against all the laws of fashion, Rapunzel never visits a hairdresser as cutting her hair destroys its magic. Having a braid over 21 m³² long, however, is worse than a simple fashion faux pas. Through the use of her braid as an elevator cable, Rapunzel's hair follicles are likely to have been damaged from repetitive excessive pulling, a condition known as traction alopecia (TA).^{33 34} In the long run TA can lead to permanent hair loss.³⁴ A more common symptom, already present in early stage TA, is scalp pain.³⁴ This can lead to headaches,³⁵ and subsequently to a mood not even a fairytale princess can brush off.³⁵ Her long hair might keep Gothel young but, thanks to constant headaches, Rapunzel is the one who needs a magical remedy.

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