

RESEARCH

CHRISTMAS 2014: GOING TO EXTREMES

Nintendo related injuries and other problems: review



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Abstract

Objective To identify all reported cases of injury and other problems caused by using a Nintendo video gaming system.

Design Review.

Data sources and review methods Search of PubMed and Embase in June 2014 for reports on injuries and other problems caused by using a Nintendo gaming system.

Results Most of the 38 articles identified were case reports or case series. Injuries and problems ranged from neurological and psychological to surgical. Traditional controllers with buttons were associated with tendinitis of the extensor of the thumb. The joystick on the Nintendo 64 controller was linked to palmar ulceration. The motion sensitive Wii remote was associated with musculoskeletal problems and various traumas.

Conclusions Most problems are mild and prevalence is low. The described injuries were related to the way the games are controlled, which varies according to the video game console.

Introduction

Nintendo was founded in 1889 by Fusajiro Yamauchi in Kyoto, Japan.¹ The company originally sold Japanese playing cards, but after the second world war it experimented with products such as toys, hotels, and taxi services. In the late 1970s, Nintendo started selling video game systems. With its success in Japanese and Western markets, the company grew to become the multinational that entertains so many people today. Its latest big hit, the Wii console, has sold more than 100 million units.² Because of its popularity, Nintendo's consoles and handheld units are common Christmas presents.

Nintendo's innovative products are also increasingly used for healthcare. The pressure sensitive balance board, which assesses balance ability,³ can train balance in older people and patients with multiple sclerosis or Parkinson's disease.⁴⁻⁸ In addition,

the motion sensitive Wii remote controller can be used to improve basic laparoscopic skills,^{9, 10} and so called exergames are used for exercise in children with cystic fibrosis,¹¹ weight loss,^{12, 13} cardiovascular training,¹⁴ and postoperative rehabilitation.¹⁵

However, there have been reports of Nintendo related injuries and other problems, which range from mild to life threatening. We therefore decided to gather all reported cases of Nintendo related problems to see whether a Nintendo is safe to give as a Christmas present.

Methods

In June 2014 we searched PubMed and Embase using the terms "Nintendo", "Game & Watch", "Famicom", "Game Boy" (or the commonly miswritten "Gameboy"), "Virtual Boy", "iQue", "GameCube", and "Wii". Our search identified 1198 articles—543 from PubMed and 655 from Embase. After reading the titles and abstracts (if available), we selected all original papers that reported Nintendo related problems. We then screened all papers, including three reviews of Wii related injuries,¹⁶⁻¹⁸ for other suitable references. With the exception of one German article, all papers were written in English.

Results

We identified 38 relevant papers (30 case reports, seven case series, and one prospective study). The reports were split into two groups—before and after the introduction of the Wii (www.nintendo.co.uk). Before the Wii, Nintendo's consoles had a traditional wired controller with buttons or a joystick. Wii games, however, are controlled by a motion sensitive remote, which requires players to swing their arms, resulting in more traumatic injuries.

Early reports

One of the first cases was that of a 13 year old girl who experienced a generalised seizure after playing Super Mario Bros on her Nintendo entertainment system (1984) for almost three hours.¹⁹ This “Nintendo epilepsy” was attributed to a rapid change of on-screen patterns. A large multicentre study later showed that patients with a history of seizures when watching television were more sensitive to a game similar to Super Mario Bros than to a normal television programme.²⁰

In the early 1990s two cases of Nintendo related incontinence were published.^{21, 22} One described a boy who developed episodes of faecal soiling,²¹ and the other reported three (related) boys who suddenly developed daytime enuresis.²² All children were so engrossed in Super Mario Bros that they ignored their urge to go to the toilet. All cases were successfully treated by explaining how to pause the game. One of the authors jokingly suggested that Nintendo should develop a wet sensor that aborts the game if a player loses bladder control.²²

In 1991, an author described how his son developed intense neck pain after playing his Game Boy—a portable system first marketed in 1989 with a small unlit display—for 30 minutes.²³ His position while playing was reported as “hunched over, chin almost resting on his chest, elbows bent while he holds the small screen close to his face.” The boy’s problems, dubbed “Nintendo neck,” were attributed to playing in this position.

Similarly, “Nintendo elbow” was diagnosed in a 12 year old boy who had pain in his right elbow after playing his Nintendo “a lot” for more than a month.²⁴ Symptoms resolved with non-steroidal anti-inflammatory drugs and rest.

We also found a report of “Nintendo hallucinations.” The patient, who had previously been diagnosed as having paranoid schizophrenia, had persistent auditory hallucinations of video game music.²⁵

Nintendinitis

Nintendo related problems in the thumb, hand, and wrist are referred to as “nintendinitis” or “nintendonitis.” All reports, mostly letters to the editor, point out that strenuous game play with a traditional controller can result in temporary discomfort, most commonly as a result of tendinitis of the extensor pollicis longus, and can be treated by rest or non-steroidal anti-inflammatory drugs (or both).

The first case dates back to 1990. The patient was a 35 year old woman who experienced severe pain in her right thumb after playing her Nintendo uninterrupted for five hours.²⁶ A similar case, which was termed nintendinitis—a form of tendinitis—was caused by repetitive microtrauma.²⁷ The authors of similar case reports suggested that prophylactic hand care instructions should be given at school.^{28, 29} Another report described a boy who developed eczema on both his thumbs after playing his Game Boy on a daily basis.³⁰

After the introduction of the Nintendo 64 console in 1997, reports of the original nintendinitis subsided. But with a new controller, new problems arose. The Nintendo 64 was Nintendo’s first console that featured three dimensional graphics.¹ Its controller featured a joystick that made three dimensional navigation easier but also gave rise to ulcerative nintendinitis—a central palmar ulcer.^{31, 32} In some games, Mario Party in particular, players had to rotate the joystick quickly with their thumb. Players discovered that it was quicker to rub the joystick with their palm, but this resulted in ulceration. After receiving more than 90 complaints, Nintendo handed out protective gloves

to all owners of the game, which had already sold a million copies.³³

Enter the Wii

In 2006, Nintendo introduced the Wii, a console with a controller (remote) that detects motion, speed, and position.¹ In its most popular game, Wii Sports, players swing these Wii remotes to participate in sports such as tennis and boxing. This resulted in new types of injury, mostly traumatic ones. In 2009, a preliminary report with data on 21 Wii related injuries from the National Electronic Injury Surveillance System showed that most injuries were confined to the upper extremities, face, and neck.³⁴ A review of 39 Wii injuries that gamers self reported through a special website found that Wii Sports had caused the injury in 34 cases, with tennis being most commonly implicated.³⁵ The most common injuries were hand lacerations and bruising, as well as periorbital haematomas.

“Wiiitis”

The first Wii related injury, dubbed “wiiitis,” was seen in a 29 year old man who experienced acute tendinitis of his right infraspinatus muscle after playing Wii Sports for several hours.³⁶ Others also reported acute muscle pain in the upper extremities after playing the game.^{37, 38} One report even described a case of arm swelling and a rise in creatine kinase, consistent with serious muscle injury.³⁹ Magnetic resonance imaging in another case of upper extremity wiiitis showed increased signal intensity in various muscles of the upper extremities.⁴⁰ Wiiitis can affect various muscles in the arm and shoulder, depending on the movements made during different games. All cases were treated with rest and non-steroidal anti-inflammatory drugs.

As with nintendinitis, the term wiiitis is used for various injuries. In 2010, four paediatric cases of wiiitis were reported; children presented not only with a painful arm, but also with a painful neck and postural deviations.⁴¹ Another report described a case of carpal tunnel syndrome in a woman who played a bowling game for six to eight hours daily for 10 days.⁴² There are also two reports of Achilles wiiitis—a (partial) tear of the Achilles tendon.^{43, 44} In addition, one case of wiiitis presented as a massive venous thrombosis of the gluteal veins that reached as far as the inferior vena cava.⁴⁵

Wii knee

The term “Wii knee” encompasses all Wii related knee injuries. The first report was of a young woman who dislocated her left patella when she fell while serving a tennis ball in Wii Sports.⁴⁶ In addition, a boy who twisted his knee while playing the Wii dislocated his patella and fractured his lateral femoral condyle,⁴⁷ and another report mentions a medial meniscal tear in a woman who was playing a bowling game.⁴⁸

Surgerii

Wii related injuries can be life threatening. A 55 year old woman sustained a massive haemothorax (>1250 mL) after falling on her sofa while playing tennis on her Wii.⁴⁹ Another patient required resection of infarcted bowel when a pre-existing paraumbilical hernia strangulated while doing exercises with Wii Fit.⁵⁰ Two patients were admitted with ischaemic stroke owing to an internal carotid artery dissection after playing the Wii.⁵¹

Various Wii related fractures have also been reported. A 38 year old man fractured his spinous C7 process after swinging a Wii remote vigorously,⁵² and a girl who fell during a game of Wii

Fit sustained a small fracture of the fifth metatarsal of her right hand.⁵³ Another report described an intra-articular fracture of the first metacarpal bone in a patient who was playing a sports game.⁵⁴

Other injuries include a forehead laceration in a girl whose brother accidentally hit her with a Wii remote,⁵⁵ and permanent loss of vision in a 7 year old boy after he accidentally struck his left eye while playing Wii Sports.⁵⁶ Finally, a woman experienced rupture of the extensor pollicis longus after hitting a wall while playing tennis.⁵⁷

Discussion

Most reported problems related to use of the Nintendo are mild, and, given the number of gaming systems sold, the prevalence is low. The type of injury depends on the control system used. Excessive game play with traditional controllers is associated with tendinitis of the thumb; the Nintendo 64 joystick can lead to palmar ulceration; and the motion sensitive Wii remote can cause musculoskeletal problems and various traumas.

Nintendo has often acted on these problems—for example, the hand out of protective gloves³³ and the massive give away of protective silicone covers for the Wii remote to prevent trauma (and smashed TV screens).⁵⁸ These days Nintendo even warns players with in-game messages that remind them to take a break.

Overall, a Nintendo is a relatively safe Christmas present. However, those who receive such a gift should not swing the controller too hard, they should be careful about where they play, and they should take frequent breaks.

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Summary points

Nintendo related injuries and other problems have been reported for all types of video game consoles

The injury depends on the way the game is controlled.

Traditional wired controllers are associated with tendinitis of the thumb

Motion sensitive Wii remote controllers can give rise to (upper extremity) musculoskeletal problems and various traumas

Nintendo is relatively safe if the player takes frequent breaks and plays in a safe place

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