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Pickleball: A growing source of community noise

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ABSTRACT

Pickleball, an increasingly popular racquet sport worldwide, produces a loud, distinct popping sound with each hit of the ball. A typical set of 4 outdoor pickleball courts may expose neighbors to more than 30,000 repetitive “pops” per day, several days a week. Even with doors and windows shut, pops are often audible inside nearby homes. A national online pilot survey of 264 communities, designed to purposefully explore the impacts on residents, found that pickleball noise negatively affects quality of life and leads to health concerns. A content analysis of public statements about the impacts of pickleball noise found that nearby residents may experience severe distress, trauma- or PTSD-like symptoms, anxiety, sleep disruption, and hearing “phantom” popping sounds in the absence of pickleball play. Chronic exposure to noise repeatedly activates the body’s stress response which may be exacerbated by other secondary stressors, like powerlessness to control the noise and conflicts between neighbors and players. Time-averaged A-weighted decibel metrics are not appropriate for assessing the impacts of this type of impulsive, high-event-rate noise. A multidimensional approach incorporating appropriate decibel metrics, number of noise events, duration of exposure, and relevant non-acoustic factors is required to understand the impacts of pickleball noise on health and quality of life.

INTRODUCTION

Pickleball is an increasingly popular racquet sport played worldwide with hard paddles and plastic balls that produce loud “pops.” These repetitive impulse sounds introduce a new and distinctive source of unwanted and potentially harmful noise in residential environments, exposing residents living near busy courts to thousands of sharp “pops” each day. An audio recording of the noise from 4 pickleball courts can be heard at <https://doi.org/10.5281/zenodo.15566001> [1].

In the US, more than 18,000 new courts were built in 2024 [2], exposing residents in many communities to repetitive impulsive noise. The conflicts that have erupted over pickleball noise have been covered in hundreds of news reports, generated countless social media posts, and led to approximately 200 legal claims in the United States [3]. Similar issues are emerging in Singapore, Vietnam, Canada, India and Australia where the sport has also become popular. In the Netherlands, noise from padel, a similar racket sport producing repetitive impulse noise, is subject to environmental noise regulations and has prompted the development of a padel-specific guidance document [4]. In Spain, a club owner was imprisoned for subjecting nearby residents to excessive noise from padel in violation of the country’s legal noise limits [5].

Pickleball produces an impulsive sound when the racket makes contact with the ball. The sound has a rapid onset of 1-2 millisecond (ms) short duration that repeats, echoes, and reverberates in a high-density fashion for another 20 milliseconds, as shown in Figure 1 (Willis).

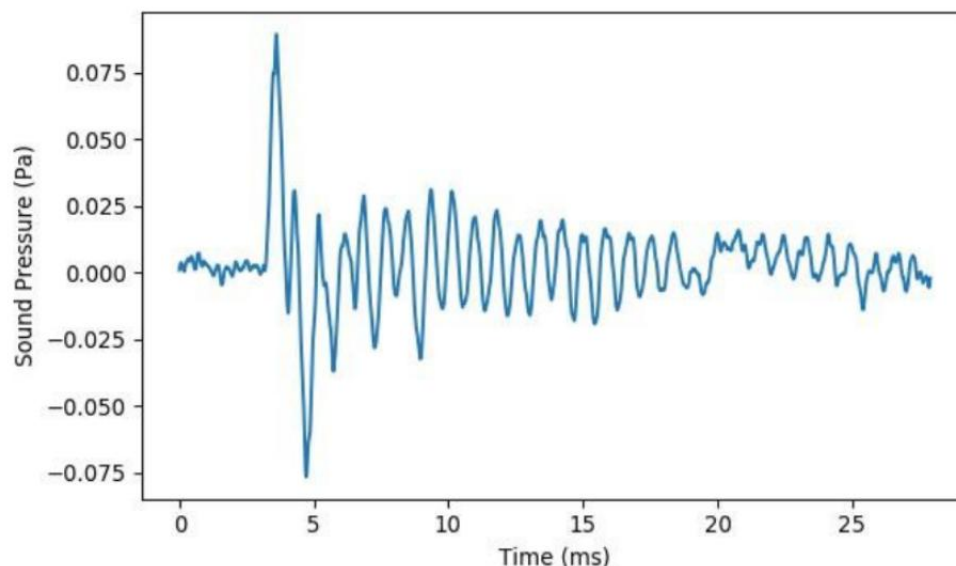


Figure 1. Pickleball noise sound pressure trace.
Reproduced with permission from Lance Willis, Spenderian and Willis, Tucson, AZ

Pickleball pops have been measured courtside at 69.7 dBA LAeq, 92.2 dBA LAS max and 115.6 dBC LCpeak [6]. Additional acoustic factors that may affect perception of pickleball noise include its spectral frequency (Hz), number of noise events, and cumulative exposure.

The pickleball pop captures listener attention, with an average peak frequency near 1200 Hz, similar to the frequencies used in vehicle backup alarms. Each busy court produces approximately 900 pops/hour [7]. Courts are often open 10-12 hours per day and a set of busy courts can produce more than 20,000 individual pops (noise events)/day, as shown in Figure 2.

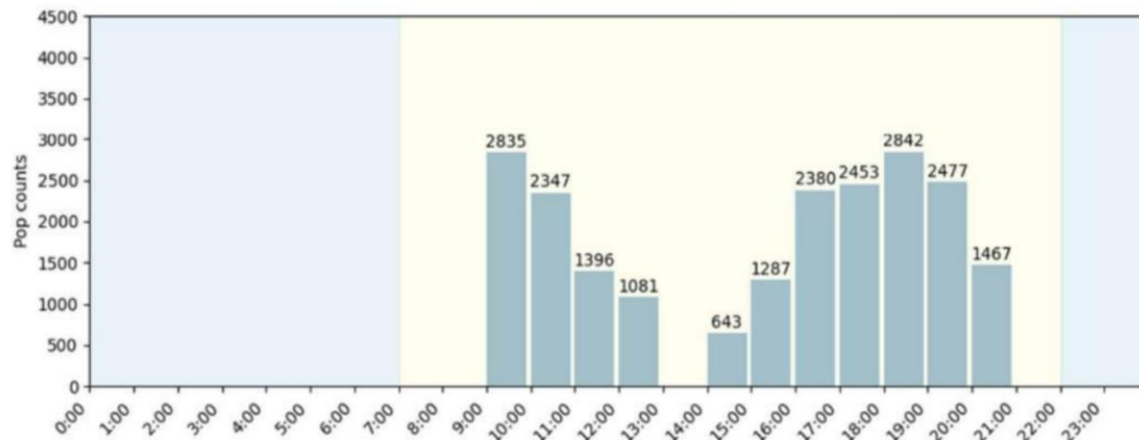


Figure 2. Pops per hour at 4 pickleball courts, Total of 21,208 total pops in one day.
Reproduced with permission from NoiseNet US Operations, Brisbane, Australia.

Pickleball noise is a local, community experience. Apart from the sound that is generated, non-acoustic factors such as social conflict, perceived unfairness, or the residents' inability to quiet their homes may also contribute to adverse impacts of noise.

Few, if any, studies have examined the effects of long-term exposure to impulsive noise on the general public. This paper synthesizes findings from three recent studies to characterize the impacts of long-term exposure to pickleball noise: a content analysis of publicly reported health concerns [8], a pilot community survey of 264 impacted neighborhoods [9], and a thematic analysis of non-acoustic factors contributing to pickleball noise annoyance [10].

REPORTED HEALTH CONCERNS

The link between environmental noise and adverse health outcomes is well-established. Consistent with this, the recent analysis of self-reported health concerns specific to pickleball noise also highlighted significant health issues. A self-reported sense of trauma, feeling tortured, and/or severe distress was noted frequently by people who spoke publicly about their concerns with pickleball noise. Examples of comments categorized as severe distress include "The pain, suffering and mental anguish is unbearable" and two reports of suicidal thoughts related to the noise. Disrupted sleep, hearing phantom pops (i.e. hearing pops when no one is playing), elevated blood pressure and mental health concerns were other concerns frequently mentioned by residents living near courts [8]. See figures 3 and 4.

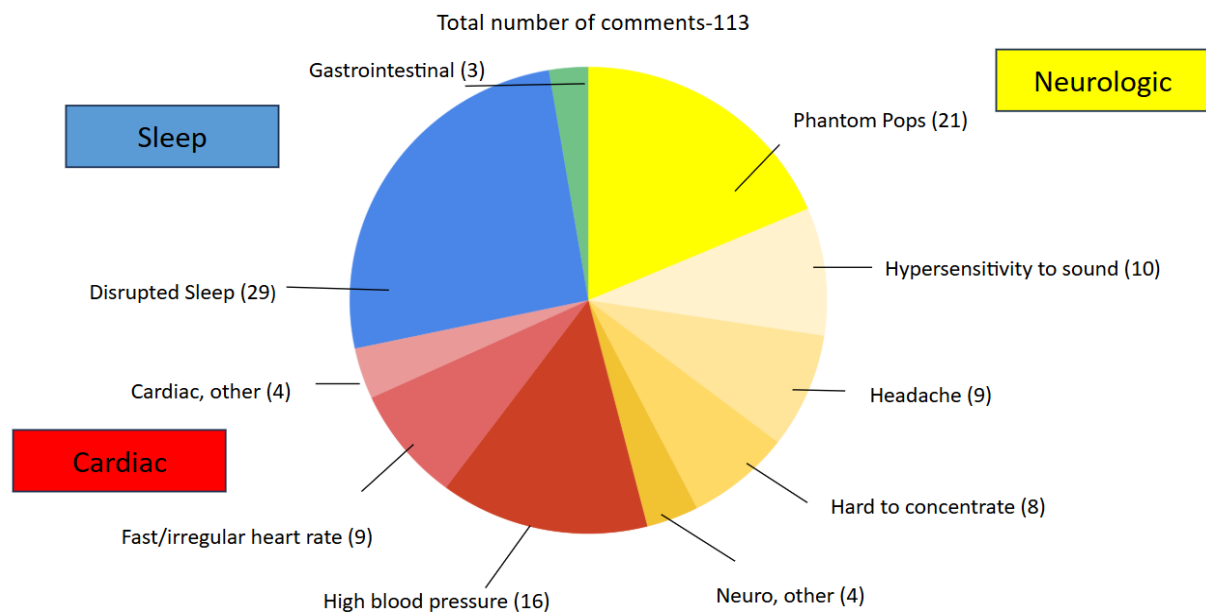


Fig. 3. Self-reported physical symptoms from pickleball noise exposure

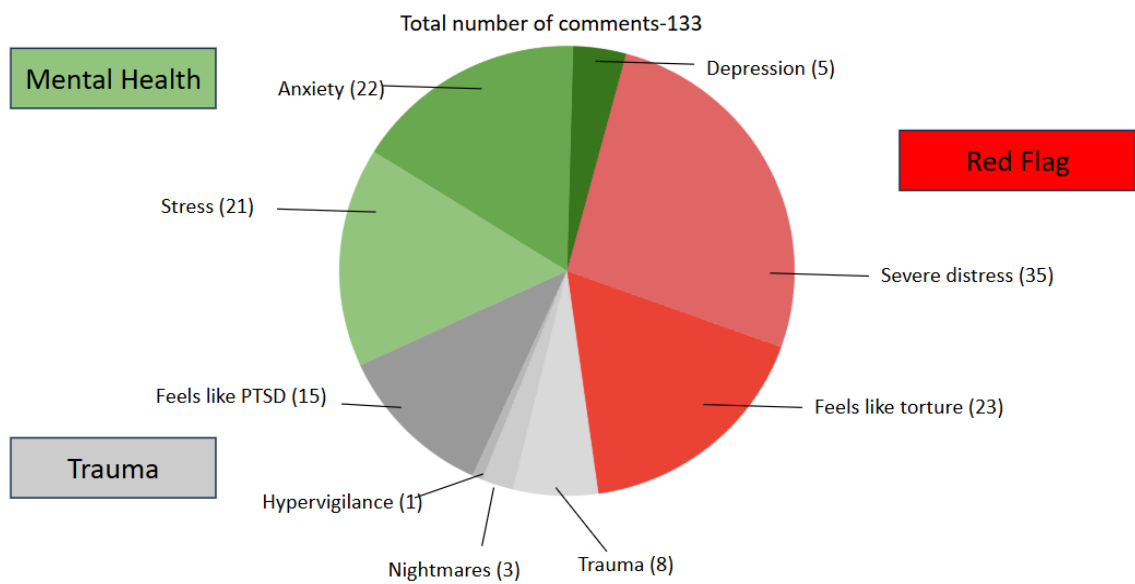


Fig. 4. Self-reported psychological symptoms from pickleball noise exposure

COMMUNITY PILOT SURVEY

A community pilot survey of residents living within 10-1000+ feet of pickleball courts evaluated impacts from pickleball noise on health, daily life, and community experience.

More than 90% of respondents reported health concerns related to pickleball noise. The most commonly reported health concerns included an intense emotional or physical reaction to the noise (70.3%), elevated blood pressure (60.5%), hearing phantom pops (58.4%), and disrupted sleep (50.9%).

Almost 8 in 10 (79.9%) respondents reported that pickleball noise frequently or always impacted their ability to feel calm at home. Nearly 3 in 4 (73.6%) reported they could hear the noise inside their home or workplace and close to 2 of 3 (64.0%) reported they could hear pickleball noise at night (after 6 pm). The majority (58.3%) of impacted residents reported potential exposure to more than 70 hours of pickleball noise per week at their homes.

Participants reported being unable to enjoy their homes, gardens, or outdoor spaces, and many have altered routines or even relocated to avoid the noise. Comments frequently describe an ongoing sense of intrusion— *"I cannot think, I cannot concentrate, I can't do anything in my house"* and a feeling that they are being driven indoors or away from home.

Some reported major life decisions such as delaying retirement or giving up hobbies, because of the noise. Over half of respondents have either already moved or want to move or have moved part-time from their homes due to the noise.

The disruption from the noise affected relationships both at home and in the community. Almost 6 in 10 (58.8%) respondents reported stress on family relationships and almost 7 in 10 (69.9%) respondents reported stress on relationships with friends or neighbors due to the noise. Eight in 10 (81.2%) survey participants reported a loss of trust in authorities and more than 7 in 10 (72.4%) reported fear of being harassed for speaking out about the noise [9].

NON-ACOUSTIC FACTORS

A thematic analysis of public statements identified six recurring patterns of non-acoustic factors associated with pickleball annoyance and provided representative examples.

- impacted daily activities
- perceived fairness
- trust in authorities
- social conflict
- perceived control
- fear

Residents frequently described being unable to enjoy their homes. One legal filing stated, *“nearly 70% of ...waking hours are subject to the constant barrage”* while another resident described spending *“countless hours hanging around the local public library, thrift shopping, basically loitering...to stay away from home”*.

Perceived unfairness and loss in trust is a recurrent theme expressed by residents as illustrated by a lawsuit claim: *“When presented with this clear evidence of community concern, (Parks and Rec) Director Holloway dismissively stated that the petition with 25 neighborhood signatures ‘didn’t mean anything to him’ ”*.

One media account documented ostracization and *“houses being graffitied, physical threats, and even a story of how someone used their car to nudge a woman for complaining”* while another resident described a neighbor having *“her brand-new tires slashed after speaking with pballers.... you really can put your safety at risk”* [10].

DISCUSSION

The reported health impacts from pickleball noise, (e.g., elevated blood pressure, sleep disturbance, anxiety and trauma-like responses) are consistent with extensive scientific evidence on the ability of noise to trigger the body’s stress response. Noise stimulates the amygdala and activates the autonomic nervous system leading to inflammation and oxidative stress, resulting in damage to the vascular endothelium [11]. Chronic activation of this response increases the risk of cardiovascular, cerebrovascular, and metabolic harms as well as of mental health disturbances like anxiety and depression [12,13].

Impulse noise produces an “additional stress effect” compared with steady-state sound [14] and U.S. ANSI standards recommend a 5–12 dB penalty for impulsive noises [15]. Repeated exposure to unpredictable, uncontrollable impulsive sounds, such as pickleball, may amplify the physiologic stress response.

Many of the reported health effects from pickleball noise align with prior noise research, but some neurological and psychological effects may be more severe than previously reported. Hearing phantom pops may represent a trauma-related reactivity or a form of noise-induced tinnitus. For some, the phantom sounds are associated with sleep disruption and, for others, have lasted for weeks or months after moving away.

The potential for pickleball noise to trigger trauma-like responses warrants further consideration. Self-reported trauma or PTSD-like symptoms, along with frequent descriptions of “torture”, severe distress, hypervigilance, and pickleball nightmares all suggest substantial responses to the noise. The most commonly reported health concern by survey respondents was an intense emotional or physical reaction to the noise (70.3%), a question designed to screen for a possible trauma-like response. Concern about a trauma-like response is further validated by the two-thirds (66.0%) of survey respondents who reported extreme concern about impacts from

pickleball noise on veterans and individuals with PTSD, the highest among vulnerable groups listed on the survey [9].

While research has demonstrated that non-acoustic factors can explain up to a third of the variation in noise annoyance [16], they may play an even larger role with pickleball, where the sound is personal, neighborhood-based, and discretionary. Pickleball noise substantially disrupts daily life for neighbors nearby, negatively impacts interpersonal relationships, and contributes to social conflict. These factors may further heighten physiological stress responses in neighbors, potentially contributing to adverse health outcomes.

While there is no published research evaluating the prevalence of noise impacts from pickleball, one California town recently surveyed all residents living within 500 feet of courts; 41.4% reported the noise had negatively affected sleep, relaxation, work-from-home, or neighborhood experience [17]. The experiences reported by neighbors are clearly very stressful and meet common definitions of an environmental nuisance: interference with the comfortable enjoyment of life or property.

WORKING TOWARDS SOLUTIONS:

Effective mitigation of pickleball noise requires a multi-dimensional approach that reflects how communities actually experience sound. Decisions about court placement should extend beyond decibel levels to include lived experience.

Loudness (decibels) alone only moderately predicts annoyance [18] and if unpleasant sounds and/or patterns persist, lowering the sound level is not associated with lower annoyance levels [19]. Preliminary results from a detailed statistical analysis of the community pilot survey shows that using acoustic barriers, despite lowering decibel levels, do not improve residents' ability to enjoy their homes. Other acoustic characteristics (e.g. impulsivity, frequency of events, irregularity, and total duration) must be considered alongside non-acoustic factors such as noise intruding into one's home and social conflict, both of which strongly shape human response.

Additionally, the preliminary results from statistical analysis demonstrate that increased setback distance provides the most consistent benefit, correlating with improved residential enjoyment. Accordingly, policy should prioritize appropriate siting of courts and proactive efforts to reduce community conflict, with quieter equipment as a secondary, targeted measure.

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