Health and Fitness of Off-Road Riding – a scientific study

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Presentation Overview

• Study purpose
• Study overview
• Aims and findings of each phase
• Conclusions
• Next Steps
Study Purpose

Describe the physical demands of off-road vehicle riding and determine if participation is (or could be) associated with fitness and health benefits
Background

• study conducted by York University
  – Similar studies conducted of NHL players and firefighters
• results were peer-reviewed, all study components subject to ethics review board
• findings published in international academic journals
• study supported by the Canadian Off-Highway Vehicle Distributors Council, the All Terrain Quad Council of Canada, The Motorcyclists Confederation of Canada and the Government of Nova Scotia
Study Overview

Pilot Project
- Fall 2006
- Ontario Federation of Trail Riders

Phase 1
- Characterization
  - Physiological
  - Psycho-social

Phase 2
- Physical Demands of Riding
  - Testing of habitual riders
- Training Adaptations
  - Training of new riders
Phase 1

- Characterization
  - Physiological
  - Psycho-social

- nationwide survey involving 310 participant to determine the characteristics of a “typical” rider and of a “typical” ride

- information was then used as the basis to determine the health and fitness impacts of off-road riding (Phase 2)
Phase 1

Characterization

• Rider Perceptions

• most rides involve “moderate” exertion – some terrains represent a “vigorous” exertion;
• motorcycle riders experience higher levels in exertion and frequency. ATV riders experience longer durations;
• significant differences in ride characteristics (exertion, frequency, duration and physical demand) occur with the age of the rider, the length of the rider’s season, the number of hours the rider rides during a month and the number of years of experience of the rider;
• females riders tend to choose flat terrains more frequently;
motorcycle riders wear more safety gear and carry maintenance and support equipment. ATV riders wear less safety gear and the machine carries the maintenance and ride support equipment – this creates a greater potential physical demand on motorcycle riders.
Phase 2

Physical Demands of Riding

• 128 riders
• divided into age groups – 16-29, 30-49, 50+
• testing the physiological (heart rate, cardiovascular and muscle strength, oxygen consumption, etc.) demands of riding
• riders wore special helmets and equipment to monitor and measure physical demands
• compared results to demands of other recreational activities

• Testing of habitual riders
cardiovascular and muscle strength:

- moderate-intensity cardiovascular demand and fatigue-inducing muscular strength challenges, similar to other self-paced recreational sports such as golf, rock-climbing and alpine skiing

oxygen consumption (indicator of physical work):

- increased by 3.5 and 6 times the resting values for ATV and ORM riding respectively—moderate intensity activity which is in line with Canadian physical activity recommendations
heart rate measurements:

- considering heart-rate alone – off-road riding can be categorized as “hard exercise” (this may be intensified through adrenalin and/or heat stress)

off-road riding requires “a true physiological demand that would be expected to have a beneficial effect on health and fitness according to Canada’s current physical activity recommendations”

Phase 2

Physical Demands of Riding

• Psycho-social findings (quality of life)

• purpose – explore quality of life issues of off-road riders
• secondary purpose – compare levels of mental and physical functioning quality of life of recreational off-road riders to Canadian population norms
• findings compared off-road riding to non-traditional forms of physical activity participation, such as video-based exercise, martial arts and adventure sports
• off-road riders also have higher Mental Component Summary scores (measures which reflect mental status) than the non-riding normative Canadian population
based on Mental Component Summary scores, riders are “expected to have lower levels of stress and depression...and a higher overall life satisfaction”

Phase 2

- Training Adaptations
  - Training of new riders

- purpose – determine the fitness and health effects of a structured program of off-road riding on non-riders
- secondary purpose – determine if differences exist between vehicle types and riding frequency
58 participants:
- ATV 2 days/week (n=11)
- ORM 2 days/week (n=12)
- ATV 4 days/week (n=11)
- ORM 4 days/week (n=12)
- control group (status quo) (n=12)

study – six-week duration
Phase 2

Training Adaptations

• Findings

- consistent participation in off-road riding is an effective mode of alternative physical activity for decreasing heaviness, increasing muscle mass and improving endurance in the lower body

- riding 2 days/week has the same impact on musculoskeletal and aerobic fitness training outcome
“The results of this study confirm that off-road riding is a useful alternative physical activity modality for improving health-related fitness and QOL (quality of life) and could have substantial population health effects and health care savings given the high participation rates in North America”

Subsequent Study Dissemination

- government dissemination, media releases, fact sheets, support of rider federations to share findings, contact with other academic institutions/associations conducting similar studies