CAN GAMIFICATION INFLUENCE FOOD BEHAVIOR IN ADOLESCENT ATHLETES?

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NORDIC WORKSHOP ON CHALLENGES IN DIETARY ASSESSMENT IN ADOLESCENTS

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WHAT IS GAMIFICATION?

- The word gamification means the use of game design elements in non-game context to motivate and engage users.
  - The collection of points, badges, and/or rewards
  - Competing against virtual friends
- Gamification has been applied widely in marketing and customer loyalty programs. Lately, gamification has also been applied in teaching.
- For now, gamification has not been used widely in health promotion.
  - Gamification could motivate especially adolescents who use smartphones actively.

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THE BERRY UP STUDY

- We aimed to study if the food behavior of adolescent athletes can be influenced using a gamified smartphone application.
  - Change in eating behavior was compared with that resulting from conventional dietary tutoring.
- In addition, we aimed to examine the feasibility of the smartphone application in the study of food behavior.

Hypothesis: The game group will show more changes in their eating behavior compared to the tutorial group.

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PARTICIPANTS

- The participants were adolescent athletes (aged 15—19), N=53.
  - 18 (34%) of them were basketball players and 35 (66%) soccer players.
  - 21 (40%) of them were females and 32 (60%) males.
- The aim of the intervention was to ameliorate the quality of the participants' diet by:
  - increasing the use of vegetables, fruits, and berries
  - improving the quality of carbohydrates
  - replacing sugary soft drinks with water
  - add the use of fish and nuts in the diet

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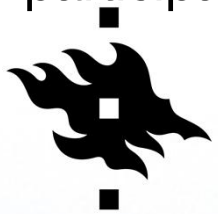
STUDY DESIGN

- The participants were randomized to game (n=24, 45%) and tutorial (n=29, 55%) groups.
- The participants in the game group kept visual food journals using a smartphone application (MealTracker™) during the four-week intervention period.
  - Meals were given points if specific food items were present in the picture.
  - The participants competed with each other.
- The participants in the tutorial group took part in a group discussion dealing with healthy diet.
- After the intervention period the participants had the opportunity to switch groups.



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THE SCORING SYSTEM

Objective	Daily goals	Points earned
To increase the use of vegetables, fruits, and berries	Eat a green vegetable	1
	Eat a red vegetable	1
	Eat a yellow/orange vegetable	1
	Eat a fresh fruit	1
	Eat fresh berries	2
To improve the quality of carbohydrates	Eat fiber-rich bread (at least 5% fiber)	2
	Eat porridge, cereal (at least 10% fiber), or muesli	2
To replace sugary soft drinks with water	Drink skimmed milk or skimmed sour milk	2
	Drink two glasses of water after exercise	2
To add the use of fish and nuts in the diet	Eat fish	3
	Eat nuts	2

MEASUREMENTS

- Background information was assessed at the beginning of the study.
  - Standing height (cm) and weight (kg) were recorded.
- Food behavior was assessed with self-administered food frequency questionnaire (FFQ) in the beginning of the study and after the intervention.
  - Weight was measured after the intervention.

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GAMIFIED FOOD DIARY

07:33

Fruit
Muesli
= 3 points

17:15

11:17

Green vegetable
Orange vegetable
Skimmed milk
Fish
= 7 points

19:29

Red vegetable
Nuts
Fiber-rich bread
= 5 points

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THE FEASIBILITY OF THE APPLICATION

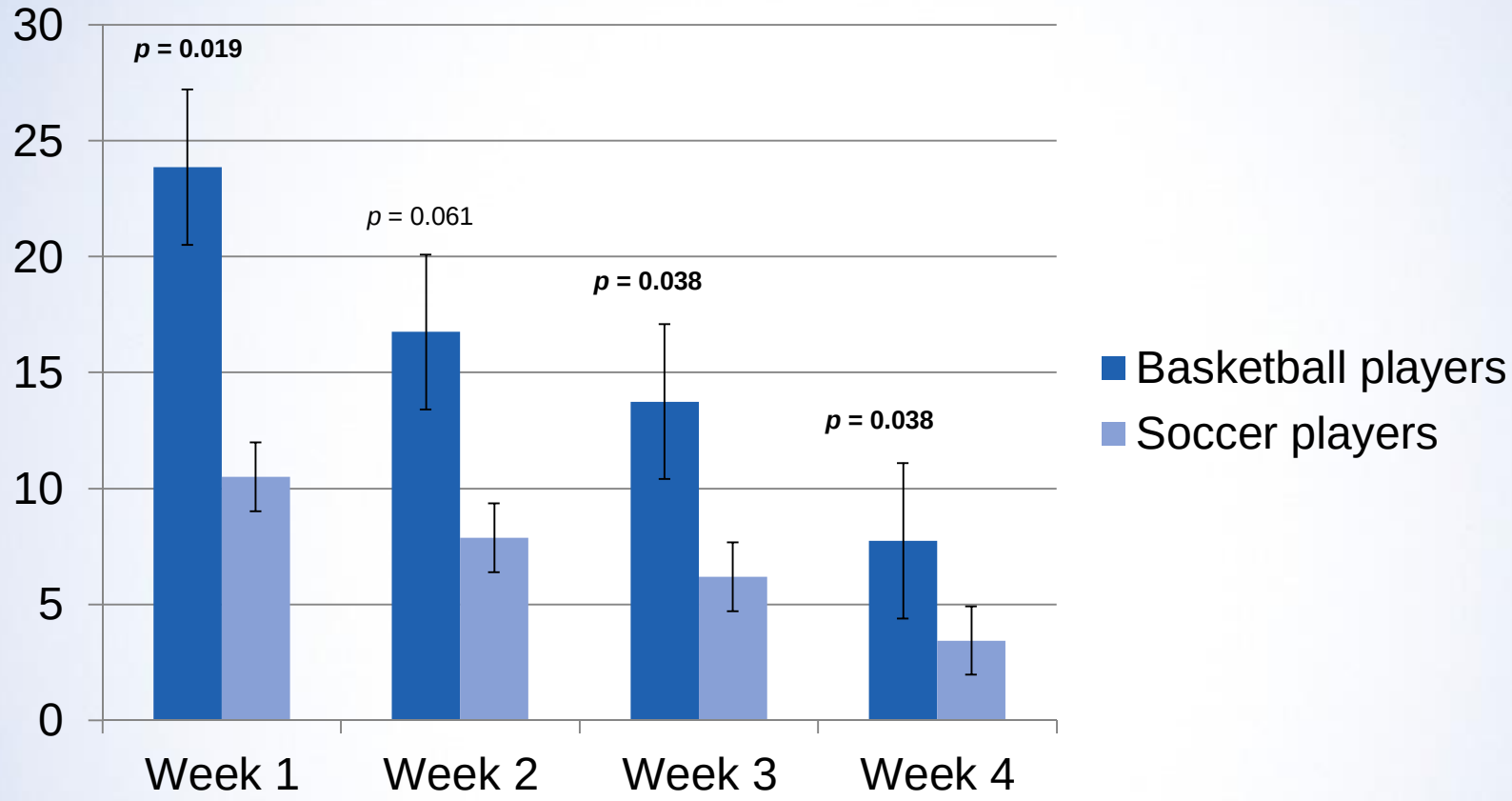

Figure 1. The number of meals loaded to the application during the intervention.

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FOOD BEHAVIOR AT THE BEGINNING OF THE STUDY

- The female athletes consumed vegetables, fruits, and berries on average 4.8 (SD 2.1) times/day, the male athletes 3.1 (SD1.9) times/day (p=0,005).
- Milk with 1% or more fat was consumed more among the male athletes compared to the female atlhetes (males 2.0 (SD 2.5) and females 0.6 (SD 1.1) times/day, p=0.021).
- The consumption of sugar-rich beverages was low among the female athletes (0.5 (SD 1.0) times/week), where as the male athletes used beverages more (2.2 (SD 2.0) times/week, p<0.001).
- Fish was used according to the recommendations.

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CHANGES IN FOOD BEHAVIOR

Female athletes

- The game group members increased their consumption of porridge more than the tutorial group members (p=0.028).

Changes within groups

- No statistically significant changes within groups.

Male athletes

- The game group members decreased their use of vegetables, fruits, and berries, whereas the tutorial group increased their use of vegetables, fruits, and berries (p=0.005).
- The game group members decreased their use of milk with 1% or more fat and milk in total, whereas the tutorial group members increased their use of milk (p=0.020 and p=0.009 respectively).

Changes within groups

- The tutorial group members increased their consumption of nuts (p=0.019).

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CONCLUSIONS

- The participants consumed vegetables, fruits, and berries relatively often already at the beginning of the study (especially females).
- More changes in food behavior were detected among the male athletes compared to the female athletes.
- Both interventions (gamified smartphone application and tutorial group meetings) triggered changes in food behavior.
- In the future, tutorial group meetings or other forms of social support could be included in the gamified intervention.
    - Gamified group intervention was conducted among adolescent soccer players in November 2013. The feedback was positive.

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