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Supplements, Analgesics and Alcohol Use of German Amateur Golfers

Nahrungsergänzungsmittel-, Schmerzmittel- und Alkoholkonsum bei deutschen Amateurgolfern

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Summary

› **Problem:** To cope with the increasing pressure to perform, more and more amateur athletes are turning to performance-enhancing substances. Although the use of dietary supplements, non-steroidal anti-inflammatory drugs and alcohol does not fall into the category of 'doping', it nevertheless harbors risks and side effects during sporting activity.

› **Methods:** An online questionnaire developed specifically for this study was used to research the consumption of supplements, analgesics, and alcohol among golfers.

› **Results:** A total of 877 golfers (257 women, 619 men; 1 diverse person; age: M=56; SD=15 years) participated in the survey. The results of the survey showed that 40.1% of golfers consumed supplements, 46.6% analgesics, and 40.4% alcohol. Dependent on participation in golf tournaments, the consumption of supplements (43.0%), analgesics (52.1%) and alcohol (47.2%) increases significantly. Gender correlates significantly with the consumption of alcohol at golf tournaments (p=0.001); more men consume alcohol than women. Age correlates significantly and negatively with the consumption of supplements at golf tournaments (r=-0.131; p=0.001) and the consumption of alcohol at golf tournaments (r=- 0.238; p=0.000).

› **Discussion:** The frequency of consumption was alarming for a large proportion of the golfers surveyed. Therefore, there is an urgent need to educate golfers about the risks associated with increased consumption of supplements, analgesics, and alcohol in connection with sporting activities to avoid damage to one's body.

Zusammenfassung

› **Problem:** Um dem steigenden Leistungsdruck gerecht zu werden, greifen zunehmend mehr Breiten- und Freizeitsporttreibende zu leistungssteigernden Substanzen. Die Einnahme von Nahrungsergänzungsmitteln, nichtsteroidalen Antirheumatika und Alkohol zählt zwar nicht zur Kategorie ‚Doping', birgt dennoch Risiken und Nebenwirkungen bei sportlicher Aktivität.

› **Methode:** Um den Konsum von Nahrungsergänzungsmitteln, Schmerzmitteln und Alkohol bei Golfspielenden zu erforschen, wurde ein eigens für diese Studie entwickelter Online-Fragebogen eingesetzt.

› **Ergebnisse:** An der Fragebogenerhebung nahmen insgesamt 877 Golfspielende (257 Frauen, 619 Männer, 1 Diverse; Alter: M=56; SD=15 Jahre) teil. Die Ergebnisse der Befragung zeigen, dass 40,1% der Golfspielenden Nahrungsergänzungsmittel, 46,6% Schmerzmittel und 40,4% Alkohol konsumieren. In Korrelation mit der Teilnahme an Golfturnieren steigt der Konsum von Nahrungsergänzungsmitteln (43,0%), Schmerzmitteln (52,1%) und Alkohol (47,2%) deutlich an. Das Geschlecht korreliert signifikant mit dem Konsum von Alkohol beim Golfen (p=0,001); es konsumieren prozentual betrachtet mehr Männer Alkohol als Frauen. Das Alter korreliert signifikant und negativ mit dem Konsum von Nahrungsergänzungsmitteln bei Golfturnieren (r=-0,131; p=0,001) und dem Konsum von Alkohol bei Golfturnieren (r=- 0,238; p=0,000).

› **Diskussion:** Die Konsumhäufigkeit nahm bei einem Großteil der befragten Golfspielenden ein bedenkliches Ausmaß an. Es besteht daher bei Golfspielenden ein dringender Aufklärungsbedarf über einen adäquaten Konsum von Nahrungsergänzungsmitteln, Schmerzmitteln und Alkohol in Verbindung mit der Sportausübung, um Schädigungen des Organismus zu vermeiden.

KEY WORDS:
Doping, Performance-Enhancing, Health Risks, Survey

SCHLÜSSELWÖRTER:
Doping, Leistungssteigerung, Gesundheitliche Risiken, Fragebogen

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Introduction, Problems, and Aim

Improving athletic performance is a central focus of training and research, especially in performance-oriented sports. Amateur and recreational athletes are increasingly turning to performance-enhancing substances to cope with the pressure to perform (19). Presumably, there are significantly higher health risks associated with "doping" in recreational and amateur sports than in professional sports because there is less medical care and fewer controls of the quality of substances and preparations (29).

The use of dietary supplements (6, 13, 16, 24, 32) and analgesics (12, 31, 32, 33) is widespread among amateur athletes, but especially among competitive athletes. Taking supplements, on the other hand, poses a number of dangers, such as unexpected side effects or the ingestion of contaminated ›

Table 1

Baseline characteristics of the study population. SD=standard deviation. * The total number is greater than n due to participants could choose more than one response.

VARIABLE	(N=877)
Gender, n (%)	
Men	619 (70,6)
Woman	257 (29,3)
Diverse person	1 (0,1)
Age - mean in years (SD)	56±15
Handicap - mean HCP (SD)	23,30±13
Participation at tournaments, n* (%)	
Golf tournaments	676 (77,1)
Handicap tournaments	601 (88,9)
Non-handicap tournaments	366 (54,1)
Weekly training frequency, n (%)	
Irregular	411 (46,9)
1-2 trainings sessions	297 (33,9)
3-4 trainings sessions	148 (16,9)
4-6 trainings sessions	14 (1,6)
Daily or several times a day	7 (0,8)

Table 2

Habits about supplements usage of German amateur golfers. *The total number is greater than n due to participants could choose more than one response.

VARIABLE	(N=877)
Using supplements, n (%)	
While playing golf	352 (40,1)
At golf tournaments	291 (43,0)
Most used supplements, n* (%)	
Vitamins	264 (75,0)
Proteins	116 (33,0)
Carbohydrates	53 (15,06)
Amino acids	48 (13,6)
Creatine	31 (8,8)
Other (e.g. Minerals)	108 (30,7)
Reason of supplement use, n* (%)	
Health maintenance	211 (59,9)
Support regeneration	142 (40,3)
Prevention of injury and illness	140 (39,8)
Compensation for unbalanced nutrition	86 (24,4)
Performance increase	58 (16,5)
Treatment of illness	30 (8,5)
Other	48 (13,6)

substances and subsequent positive doping samples (20). The consumption of analgesics is not harmless and poses a health risk for athletes that should not be underestimated (18, 33). As a socially accepted and most widespread everyday drug, alcohol is often underestimated, which makes it particularly dangerous. Athletes are not exempt from the impact that alcohol has on society (1). Alcohol consumption in the context of golf is not only a health risk, it can also have an accident-promoting effect. Few athletes consider or ignore the health risks associated with the use of performance-enhancing substances.

Some evidence suggests that "performance-enhancing substances" are also used in golf. This study aimed to investigate the extent to which golf amateurs consume dietary supplements, analgesics, and alcohol as part of their sporting activities.

Material and Methods

Study Design, Setting and Participants

Approved by the Ethics Committee of the German Sport University Cologne (142/2021, 05.10.2021), the study followed good scientific practice and the Declaration of Helsinki. Participants consented to the use of their anonymized data. Data collection was completed using standardized questionnaires in a nationwide, online survey. Since no questionnaire from previous studies was available on the topic of 'doping in golf', an in-house questionnaire was designed according to Kallus (2016) and Bortz and Döring (2006) and subjected to a questionnaire pretest. The suggestions from the pretest supported the further development of the survey instrument.

The questionnaire included 26 closed questions related to sociodemographics and consumption and use behavior of dietary supplements, analgesics, and alcohol while golfing. The format of questions included multiple-choice questions that were on a 6-point Likert scale with an input field, decision questions, and choice questions with multiple choices.

Data Collection

Passive recruitment of the amateur golfers surveyed was done by contacting personally known golfers and 740 German golf clubs by e-mail. Clubs were asked to support the study by sharing the survey link with their club members. Recruitment took place between November 3 and December 31, 2021 (66 days).

Data Analysis

The data was collected from SoSci Survey, a German platform for online surveys. The chi-squared test was used to test for independence of categorical variables ($\alpha<0.05$). The corresponding strengths of association were expressed by Pearson's r. Multiple linear regression was used to measure the relationship between a dependent variable and one or more independent variables ($\alpha<0.05$). The IBM SPSS® 25 software was employed.

A total of 1214 completed data sets were recorded, with a gross response rate of 57.95%. A total of 877 participants (adjusted) answered the questionnaire in full, resulting in a net response rate of 41.86%.

Results

Population Characteristics

A total of 257 women (29.3%), 619 men (70.6%), and one diverse person (0.1%) participated in the survey. The average age was 56 years (SD=15). The mean Handicap (HCP) of participants, was 23.30 (SD=13). The Handicap of the participants ranged from 0 (very good amateur player) to 54 (beginner classification). A total of 676 (77.08%) golfers reported participating in golf tournaments (table 1).

Supplement Use

The results show that 40.1% of golfers consume dietary supplements in connection with golf. In correlation with participation in golf tournaments, the consumption of dietary supplements (43.0%) increases (p=0.001). The majority of golfers (considering multiple responses) consumed vitamins (75,0%), followed by proteins (33,0%). Reasons for ingestion (considering multiple responses) were: 1. Maintaining health (59.94%), 2. Supporting recovery (40.3%), 3. Preventing injury and illness (39.8%), 4. Compensating for unbalanced diet (24.4%), 5. Enhancing performance (16.48%), and 6. Treating illness (8.52%) (table 2). Age was significantly and negatively correlated with supplement use in golf tournaments (r=-0.131; p=0.001). The intake of supplements and gender are independent of each other. The age of the golfers has a significantly correlation, but this is only marginal. With increasing age, the consumption of dietary supplements decreases. The coefficient is -0.008 and can be classified as small. Gender has no correlation on the consumption of dietary supplements (table 5).

Analgesic Use

The results show that 46.6% of golfers consume analgesics in connection with golf. In correlation with participation in golf tournaments, the consumption of analgesics (52.1%) increases (p=0.000). The majority of golfers (considering multiple responses) consumed non-opioid pain relievers (95,6%), followed by Weak-acting opioids (2,2%). Strong opioids were not taken at all. Reasons for ingestion (considering multiple responses) were: 1. Treatment of acute pain (97,6%), 2. Better mobility (32,0%), 3. Pain prevention (21,5%), 4. Support regeneration (2,9%) and 5. Performance increase (table 3). The intake of analgesics and age are independent of each other. Gender has a highly significant correlation. Women consume more analgesics than men (coefficient=0.457). Age has no correlation on the consumption of analgesics (table 5).

Alcohol Use

The results show that 40.4% of golfers consume alcohol in connection with golf. In correlation with participation in golf tournaments, the consumption of alcohol (47.2%) increases (p=0.000). The majority of golfers (considering multiple responses) consumed beer (67,0%), followed sparkling wine (33,1%) and spirits (26,3%). Reasons for ingestion (considering multiple responses) were: 1. Socializing (96,1%), 2. Looseness (11,0%), 3. Helped clear their heads (3,1%), 4. Performance increase (1,7%) and 5. Concentration increase (1,1%) (table 4). Gender correlates significantly with the consumption of alcohol while golfing (p=0.001); more men consume alcohol than women. Age correlated significantly and negatively with the consumption of alcohol at golf tournaments (r=-0.238; p=0.000). The age of the golfers has a highly significant correlation. With increasing age, the consumption of alcohol decreases. The coefficient is -0.025 and can be classified as small. Gender has no correlation on the consumption of alcohol (table 5).

The results of the survey showed that 40.1% of golfers consumed supplements, 46.6% analgesics, and 40.4% alcohol. Dependent on participation in golf tournaments, the consumption of supplements (43.0%), analgesics (52.1%) and alcohol (47.2%) increases significantly (figure 1).

Sports Performance

The results show that there is a negative relationship between the handicap and supplement and analgesics use. The better playing potential of his player, the higher the consumption. The result related to training frequency correlates significantly and positively with the consumption of dietary supplements and analgesics. The higher the training frequency, the higher the consumption. The results show that there is a negative association between the handicap and alcohol consumption. The result regarding the frequency of training correlates significantly and negatively with the intake of alcohol. The better playing potential of his player, the higher the consumption. The lower the exercise frequency, the higher the consumption. The results further show that the handicap have a significantly correlation on the consumption of dietary supplements, but this is only marginal. With increasing handicap (lower playing strength) the consumption of dietary supplements decreases. The coefficient is -0.009 and can be classified as small. Training frequency has a highly significant effect. The coefficient is 0.256 and can be classified as small. With increasing weekly training frequency, the consumption of dietary supplements increases. The handicap has a highly significant correlation on the consumption of analgesics. The consumption of analgesics decreases with increasing handicap. The coefficient is -0.032 and can be classified as small. The handicap has a significant correlation on the consumption of alcohol. The consumption of alcohol decreases with increasing handicap. The coefficient is -0.011 and can be classified as small. The training frequency has a highly significant effect. The coefficient is 0.069 and can be classified as small. The consumption of alcohol decreases with increasing weekly training frequency (table 5).

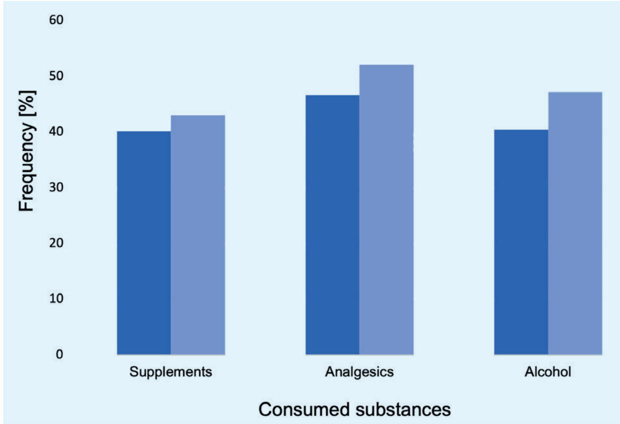

Figure 1

Substances consumed (multiple responses) by German amateur golfers during training and tournament participation. Dark blue=during golf; light blue=during golf tournaments.

Discussion

According to Bortz and Döring's research, there is a steep rise in survey response when surveying homogenous target groups using interesting topics and a flat rise when surveying heterogenous target groups using less interesting topics (3). The rise in the response curve suggests that the respondents formed a relatively homogeneous target group and that the question was found to be interesting by the participants.

In summary, the results of the survey show that 40.1% of golfers consume nutritional supplements, 46.6% analgesics and 40.4% alcohol. In correlation with participation in golf tournaments, the consumption of dietary supplements (43.0%), analgesics (52.1%) and alcohol (47.2%) increases significantly. Gender correlates significantly with the consumption of alcohol while golfing; more males consume alcohol than females in percentage terms. Age correlates significantly and negatively with the consumption of supplements at golf tournaments and the consumption of alcohol at golf tournaments.

Supplements

The results show that dietary supplement use and golf tournament participation are interdependent. Our results are ›

Table 3

Habits about analgesics usage of German amateur golfers. *The total number is greater than n due to participants could choose more than one response.

VARIABLE	(N=877)
Using analgesics, n* (%)	
While playing golf	409 (46,6)
At golf tournaments	352 (52,1)
Most used analgesics, n (%)	
Non-opioid pain relievers (e.g. Ibuprofen)	391 (95,6)
Weak-acting opioids (e.g. Tramadol)	9 (2,2)
Strong opioids (e.g. Morphine)	0 (0)
Other	14 (3,4)
Reason of analgesics use, n* (%)	
Treatment of acute pain	399 (97,6)
Better mobility	131 (32,0)
Pain prevention	88 (21,5)
Support regeneration	12 (2,9)
Performance increase	6 (3,9)
Other (e.g. Treatment headache)	17 (4,2)

Table 4

Habits about alcohol usage of German amateur golfers. * The total number is greater than n due to participants could choose more than one response.

VARIABLE	(N=877)
Using alcohol, n (%)	
While playing golf	354 (40,4)
At golf tournaments	319 (47,2)
Most used alcohol, n* (%)	
Beer	237 (67,0)
Sparkling wine	117 (33,1)
Spirits	93 (26,3)
Wine	68 (19,2)
Mixed drinks	43 (12,2)
Other (e.g. "Birdie-Schnapps")	23 (6,5)
Reason of alcohol use, n* (%)	
Socializing	304 (96,1)
Looseness	39 (11,0)
Get a clear head	11 (3,1)
Performance increase	6 (1,7)
Concentration increase	4 (1,1)
Other (e.g. fun tournament)	49 (13,8)

consistent with previous estimates that 40-100% of athletes use dietary supplements (16, 24).

The correlation and the regression between the handicap and training frequency and supplement use, are consistent with other studies. The better the playing strength of a golfer and the higher his training intensity, the more nutritional supplements he takes. Surveys show that the consumption of nutritional supplements increases with the level of training/performance (6, 13). The negative correlation we found between age and the use of nutritional supplements during golf trainings or tournaments and the results of the regression contradicts other surveys. Heinemann et al.'s (2015) study found an increased use of dietary supplements with age, however this is due to an increase in the prevalence of chronic diseases and the subsequent dietary supplement recommendations by physicians (10). In contrast, according to Garthe & Maughan (2018), there is evidence that supplement use begins at an early age (6). The finding showing that dietary supplement use and gender are independent differs from previous research. Heinemann et al.'s (2015) study showed that women in general accounted for a higher proportion of dietary supplement use (59%) than men (41%). Other studies likewise note increased supplement use among women (14, 25, 27, 28). New study findings highlight the importance of gender-specific nutrition strategies and recommendations for women, especially active women. For example, iron deficiency is very common in female athletes (34).

The handle to dietary supplements is made fast under athletes. Anti Doping Agency of Germany (NADA) advises a reflective use of dietary supplements. Accordingly, the consumption of "contaminated" dietary supplements can lead to an unintended doping finding (20). Parr et al. (2017) attest to a blatant overconsumption of dietary supplements in popular sports because the potential benefits are significantly overestimated by amateur athletes. Consequently, the need for them is overestimated (24). Unfortunately, intake is often not based on an informed decision, Additionally, the level of knowledge of consumers is often low (17). However, taking dietary supplements may do more harm than good if not based on sound research (13). In an addiction structure, dietary supplements, followed by human drugs, veterinary drugs, and narcotics, represent the first of four stages. According to this model, the dietary supplement stage represents the entry point into drug abuse (12). NADA also supports the assumption that dietary supplements represent the entry into doping mentality (20).

Analgesics

The results show that taking analgesics and participating in tournaments are interdependent. The correlation between the handicap and training frequency and analgesics use, are consistent with other studies. The regression between handicap and analgesic use is also consistent with other studies. The results are in line with the findings of Tscholl et al. (2010, 2014), which show that taking analgesics is common practice among competitive athletes. It is alarming that more than four out of ten golfers consume analgesics, as this can lead to long-term health damage. The results show that 21.5% of the golfer taking analgesics for pain prevention, which is also alarming from a health perspective. Other studies have also shown that athletes self-administer non-steroidal anti-inflammatory drugs (NSAIDs) prior to athletic participation to prevent pain and inflammation. However, scientific evidence is lacking for this approach, so athletes should be aware of the potential risks of using NSAIDs as a prophylactic agent (33). The treatment of pain in elite athletes should always follow the principles of good medicine and be multidisciplinary (8).

The results of the correlation show that pain medication use and gender are independent of each other, which differs from previous research. Pabst et al, (2013) and Knopf and Grams (2013) show that pain medication use is significantly higher in females compared to males. These results are consistent with the regression results. Gross (2006) found that there are biological differences in pain perception between the sexes, such that women suffer more from chronic inflammatory diseases (7). The results demonstrated that there is no relationship between age and pain medication use in golf training or tournament. This is contradictory to other research, such as the results of Knopf and Grams (2013), which showed that there is an increase in prevalence in drug and supplement use with age in both sexes.

Table 5

Multiple linear regression analysis to identify significant determinants. n.s.=not significant.

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	REGRESSION COEFFICIENT	P-VALUE
Dietary supplements	Gender	0,115	n.s.
	Age	-0,008	< 0,05
	Handicap	-0,009	< 0,05
	Training frequency	0,256	< 0,001
Analgesics	Gender	0,457	< 0,001
	Age	0,008	n.s.
	Handicap	-0,032	< 0,001
	Training frequency	0,069	n.s.
Alcohol	Gender	-0,216	n.s.
	Age	-0,25	< 0,001
	Handicap	-0,011	< 0,05
	Training frequency	-0,282	< 0,001

Tscholl et al. (2010) found that pain medication use increases with age among track and field athletes. Suckel (2002), found that numerous golfers suffer from health complaints and older golfers are particularly affected by incipient or existing degenerative diseases (30). This also suggests a correlation between age and pain medication use. Berrsche and Schmitt (2022) found that among young competitive athletes there is a pronounced willingness to “play hurt” and an uncritical and unreflective use of analgesics (2).

Participating in training or competitions despite acute pain or injuries is particularly risky. This phenomenon is known as “playing hurt” (26). Pain medication use is thought to increase both pain threshold and exercise tolerance (29). This suppresses the body’s warning cues, which may prevent the perception of overloads. In addition to these impending overloads of joints and tendons, athletes risk damage to blood vessels, which can lead to intestinal bleeding and kidney failure (18). Given that athletes typically self-medicate their pain by using over-the-counter pain medications or supplements, information about the safe and effective use of pain medications is needed (32).

Alcohol

As a socially accepted and most widespread everyday drug, alcohol is often underestimated, which makes it particularly dangerous. Athletes are not exempt from the influence that alcohol has on society (1). The results show that the consumption of alcohol and participation in tournaments are interdependent. This is consistent with Barnes (2014) finding that sports participants often consume more alcohol than the general population, especially after competitions. The regression results show that alcohol consumption decreases with increasing handicap and increasing weekly training frequency. The recommendation to abstain from alcohol is widespread among athletes (1); it can be assumed, based on the results, that ambitious golfers adhere to it more frequently.

The finding that alcohol consumption and gender are interdependent is consistent with other study findings specifically Franke’s (2005) study showing that women in Germany consume about 2.5 times less alcohol than men. The regression results, on the other hand, are inconsistent.

The results showing that there is a negative correlation between age and alcohol consumption during golf trainings and tournaments. The regression results also show that alcohol consumption decreases with age. In contrast, Wolter (2015) found that alcohol abuse and alcohol-related diseases increase with age. However, this is about the general population.As the most widespread and socially accepted everyday drug, alcohol is often underestimated, making it particularly dangerous. The results of Kwan et al. (2014) showed that physical activity was associated with alcohol consumption. in this study, 82% of the included studies showed a significant positive association (15).

Alcohol consumption on the golf course carries an increased risk of accidents and injuries. Alcohol consumption appears to have a causal effect on sports injuries in football (22)and is directly related to injury rates in sporting events (4). Long-term alcohol consumption can trigger dependence as well as damage to all body cells.

Methodological Strengths & Limitations

Through the online survey, it was possible to recruit numerous participants throughout Germany despite the Corona pandemic. The response rate of this survey can be highlighted as positive at 41.9%.

A significant limitation represents the potential bias of the responses due to socially desirable response behavior. In the context of this study, some golf clubs forwarded the questionnaire link to the club members. This highlights another weakness of the online survey: the sample selection process may be biased if the survey link is not forwarded to the club members by those responsible. To limit this bias, the German Golf Association was contacted prior to the start of the study. However, this contact, as well as further contact attempts in the following months, with the aim of cooperation remained unanswered. Since only participants with Internet access could be reached, the population group of ‘off liners’ was left out (3). Participation is also made considerably more difficult for certain groups, such as illiterate persons or persons with severe visual impairment (9).

Conclusion

The frequency of consumption was alarming for a large proportion of the golfers surveyed. There is therefore an urgent need to educate golfers about adequate consumption of dietary supplements, painkillers and alcohol in connection with sporting activities in order to avoid damage to the organism. With the help of the identification of possible risk groups for increased consumption behavior, targeted prevention concepts can be developed in the future.

Conflict of Interest

The authors have no conflict of interest.

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