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Further Development of the Programme on Preventive Medical Check-Ups in Austria

Brief interventions for lifestyle counselling: Umbrella review and qualitative survey

Final report

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Brief interventions for lifestyle counselling: Umbrella review and qualitative survey

Vienna, October 2025

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Content

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List of abbreviations

AC .....Alcohol consumption
BI .....Brief intervention
CI.....Confidence Interval
CVD .....Cardiovascular diseases
HD.....Healthy diet
LsC .....Lifestyle Counselling
MD .....Mean difference
N.A. .....Not applicable
NCD .....Noncommunicable disease
NRCT.....Non-randomised controlled trial
PA.....Physical activity
PMCU .....Preventive medical check-up
RCT.....Randomised controlled trial
RQ .....Research question
SR.....Systematic Review

Inhaltliche Weiterentwicklung der österreichischen Vorsorgeuntersuchung

KURZINTERVENTIONEN IN DER LEBENSSTILBERATUNG: UMBRELLA REVIEW UND QUALITATIVE UMFRAGE

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Hintergrund

- 82% der Todesfälle in Österreich aufgrund Nichtübertragbarer (inkl. Lebenstilbedingter) Erkrankungen
- Rezente Stagnation oder Verschlechterung lebensstilbezogener Gesundheitsindikatoren, darunter:

Körperliche Bewegung | Gesunde Ernährung | Alkoholkonsum

- Lebensstilberatung der österreichischen Vorsorgeuntersuchung (VU) als präventiver Ansatz
- Letzte VU-Aktualisierung 2005 indiziert Überarbeitungsbedarf

Forschungsziel

1. Identifizierung + Wirksamkeitsanalyse lebensstilbezogener Kurzinterventionen (KuI) für körperliche Bewegung, gesunde Ernährung und Alkoholkonsum
2. Explorative Bewertung ihrer Umsetzbarkeit im Rahmen der VU

Kurzinterventionen
sind zeitlich begrenzte Beratungsgespräche (wenige Minuten), die durch schriftliche Materialien und Folgesitzungen ergänzt werden können. Sie nutzen evidenzbasierte Ansätze (z. B. motivierende Gesprächsführung) und Verhaltensänderungstechniken (Aufklärung, Feedback, Handlungsplanung) in verschiedenen Formaten (persönlich, telefonisch, digital).

Methodik

Umbrella Review

- Umbrella Review (2015-2025) nach PRISMA Leitlinien
- Datenbanken: Medline, Embase, Cochrane Library
- verblindetes Screening
- Qualitätsbewertung mittels ROBIS

Qualitative Expert:innenbefragung

- Umfrage unter VU-Ärzt:innen
- Qualitative Inhaltsanalyse (deduktiv-induktiver Ansatz)
- 73 kontaktierte Praxen

Einschlusskriterien

Population	Intervention	Vergleich	Outcome
Empfänger von lebensstilbezogenen KuI in Beratungssituationen	KuI (Maßnahmen, Programme, Tools, Leitfäden) der Lebensstilberatung zur körperlichen Bewegung, gesunder Ernährung, Alkoholkonsum	Standard-versorgung oder KuI miteinander	1. Lebensstilbezogene KuI (inkl.Charakteristika); 2. deren Wirksamkeit (Verhaltensverände-rungen, Risiko-Parameter, Lebensqualität

Materialien zum Download:

Ergebnisse

Umbrella Review

1 Review (3 Reviews) hohes Verzerrungsrisiko	1 Review (55 Studien) unklares Verzerrungsrisiko	4 Reviews (138 RCTs) niedrig bis hohes Verzerrungsrisiko
Kurzinterventionen	**Kurzinterventionen**	**Kurzinterventionen**
• **Dauer:** 2 bis 13 Minuten • **Begleitmaterial** typisch • **Folgesitzung** (persönlich, telefonisch, schriftlich)	• Einzelsitzungen • **Ansatz:** v. a. Aufklärung & Feedback; Aufklärung allein- oder Handlungs-/Zielplanung • **Modus:** Infomaterial; in Persona; internet-basiert	• **Ansatz:** Motivierende Gesprächsführung o. ä. Ansätze • **Dauer:** 3 Minuten bis 2 Stunden (häufig mehrere Sitzungen) • **Begleitelemente, z. B.** Tagebücher
Wirksamkeit	**Wirksamkeit**	**Wirksamkeit**
• Gesteigerte selbst-berichtete Aktivität nach 4-12 Wochen im Ver-gleich zum Standard • **Folgesitzungen** könnten wichtiger sein als die Dauer	**Aufklärung** • **allein** begrenzt wirksam • mit **Feedback/personalisier-ter Beratung:** wirksamer für Obst-/ Gemüsekonsum + Fett-reduktion • **personalisiert:** uneindeutige Ergebnisse • **positive Botschaften** effekti-ver als negative **Handlungsplanung** • steigert Obstkonsum + Fett-reduktion nach 1. Monat • am effektivsten mit spezifischen Anleitungen + Beispielen	**Hinweis/Beratung** • reduziert Alkoholkonsum wirksam nach 12 Monaten • **kurzer Hinweis** am effektiv-sten bzgl. Menge • **Erweiterte motivierende Gesprächsführung** am effektivsten bzgl. Häufigkeit • mit **Folgesitzung** effektiver als ohne

Expert:innen-Umfrage

- 14 Teilnehmende; ~29% Drop-out; 10 vollendete Fragebögen
- **Beratungsbarrieren:** Zielgruppe (niedrige Gesundheitskompetenz und Änderungsmotivation, Sprachbarrieren, Nichterreichung von Risikogruppen) und unzureichende Zeitzuteilung
- **Zentrale Anforderungen:** erweiterte Beratungszeit, finanzielle Anreize, mehrsprachige Materialien, angemessene Honorierung und interdisziplinäre Zusammenarbeit
- **Beratung zu körperlicher Aktivität:** Folgesitzung machbar; erfordert zusätzliche Zeit, Abrechnungsmöglichkeiten und organisatorische Anpassungen
- **Beratung zu gesunder Ernährung:** Effektive Interventionen würden Hausarztpraxen überfordern. Pragmatische Lösungen: Überweisung zu Ernährungsberatung oder jährliche Sitzungen im Rahmen der VU

Diskussion

- Evidenzqualität variiert; Langzeitwirksamkeit ist unsicher; klinische Relevanz bleibt unklar
- Übertragbarkeit auf Österreich kritisch (kontextuelle Unterschiede, methodische Limitationen)
- Modifikationen für Beratung zu körperlicher Aktivität und gesunder Ernährung machbar; bestehende Alkohol-Interventionen erscheinen ausreichend
- Die Befragung zeigt potentielle Lücke zwischen Praxis und VU-Standards (empfohlene Instrumente nicht erwähnt, veraltete Techniken zitiert)
- Begleitforschung essenziell
- Verhaltensprävention alleine ungenügend; Bedarf komplementärer Verhältnisprävention

Während die Evidenz auf potenzielle Wirksamkeit im Kontext ihrer Limitationen hindeutet, bestehen erhebliche Implementierungsbarrieren. Ein multimodaler Ansatz mit strukturellen Anpassungen, angemessener Honorierung und interdisziplinären Kooperationen ist notwendig. Bis zur Validierung durch Begleitforschung erscheint der machbarste Ansatz zur Weiterentwicklung der österreichischen VU-Lebensstilberatung wie folgt:

1. Erweiterung der Beratung zu körperlicher Aktivität mit Follow-up-Komponenten (z.B. digitale Tools, Telefon, Newsletter)
2. Etablierung strukturierter Überweisungswege zu Ernährungsspezialist:innen, und
3. Schließung der Lücke zwischen bereits implementierten VU-Standards und aktueller Praxis

Summary

Introduction

Lifestyle-related diseases represent a significant public health burden in Austria. Noncommunicable diseases (NCDs) account for 82% of deaths, primarily cardiovascular disease (33%) and cancer (24%). These conditions are primarily driven by four behavioural risk factors: unhealthy diet, physical inactivity, alcohol consumption, and tobacco use.

Lifestyle-related diseases cause high disease burden

main drivers: unhealthy diet, physical inactivity, alcohol/tobacco use

Austria's preventive medical check-up (PMCU) programme, introduced in 1974, offers free annual screening and lifestyle counselling to all adults aged 18 and above. However, the programme was last updated in 2005, and population health indicators have worsened or stagnated in recent years. This report aimed to systematically identify evidence-based brief interventions for physical activity, healthy diet, and alcohol consumption, analyse their effectiveness, and explore the feasibility of implementation within the Austrian PMCU programme.

2005 last update of preventive medical check-up (PMCU)

report objective

Methods

The research project was pre-registered (DOI: 10.17605/OSF.IO/NZ3D8). For research questions 1 and 2 (identification of brief interventions and investigation of their effectiveness), an umbrella review of systematic reviews was conducted following PRISMA guidelines. A systematic search was conducted in three databases (Medline, Embase, The Cochrane Library) for publications from 2015-2025. Study selection followed PICO-framework criteria, and quality was assessed using the ROBIS tool. For research question 3 (implementation feasibility), a qualitative expert survey was conducted using questionnaires distributed to physicians performing PMCU across Austrian federal states. Responses were analysed using qualitative content analysis.

pre-registrated umbrella review (3 databases) + qualitative expert survey

Results

Evidence on brief interventions

Seven publications covering six systematic reviews were included: one on physical activity, one on a healthy diet, and four on alcohol consumption.

6 systematic reviews

Physical activity interventions (mostly 2-13 minutes and accompanied by additional material) showed effectiveness in increasing self-reported physical activity over 4-12 weeks compared to usual care, with follow-up sessions appearing more important than session duration. Findings are based on one umbrella review (high risk of bias) that included three systematic reviews (moderate quality). Long-term effects were not measured.

1 review: physical activity (PA) interventions (2-13 min) increase short-term self-reported PA; high risk of bias

Healthy diet interventions of a single session (mostly delivered by printed material, in person or internet-based) showed mixed results based on one systematic review of 55 studies (23,327 participants) with unclear risk of bias, though the included studies were consistently rated as having low risk of bias by the review authors. Educational materials/interventions alone demonstrated limited effectiveness. When combined with feedback and/or tailored advice, some studies have shown improvements in fruit and vegetable consumption (six weeks) and reduced fat intake (1-6 months), although the clinical relevance remains uncertain. Comparative effectiveness of tailored versus

1 review: mixed effect of single-session healthy diet (HD) interventions, unclear bias risk; education +feedback (+ tailored advice) and action planning showed short-term effectiveness

non-tailored feedback remains inconclusive. Action planning with specific instructions showed some positive effects. Positively framed motivational messages demonstrated superior efficacy for fruit intake compared to negatively framed messaging.

Alcohol consumption interventions predominantly based on motivational interviewing and varying from three minutes to two hours sessions (often including multiple sessions and additional elements) showed effectiveness in reducing quantity, frequency, and heavy drinking prevalence at twelve months. Findings are based on four reviews (varying risk of bias, two high). Brief advice appeared most effective for reducing quantity, while enhanced motivational interviewing was superior for reducing frequency. However, most studies had follow-up periods ≤12 months, limiting conclusions about long-term sustainability.

4 reviews: alcohol consumption (AC) interventions reduced quantity, frequency, heavy drinking at 12 months, low to high risk of bias

Implementation challenges and requirements

A qualitative survey of 14 physicians (ten completed qualitative questions) revealed substantial implementation barriers. The target population represented the greatest challenge: inadequate health literacy, low motivation for change, language barriers, and the paradox that those most needing PMCUs are not being reached. Time constraints were critical, as the allocated time for medical history, examination, and consultation was deemed insufficient. Key requirements were adequate time allocation, multilingual materials, appropriate remuneration, and interdisciplinary collaboration with dietitians, psychotherapists, and social counsellors.

10 completed surveys; target populations as main challenge; time as key requirement

Physical activity: Implementing follow-up sessions would require additional time, appropriate remuneration, health insurance billing options, and organisational adaptations.

need for PA-Follow-up

Healthy diet: Effective tailored interventions with feedback, motivational messages, and action planning would overwhelm primary care practices, requiring collaboration with dietitians, substantially increased consultation time, physician training, and adequate remuneration. Pragmatic solutions include referral to nutrition counselling services or annual sessions within PMCU.

effective HD interventions overwhelm practices

Discussion

While international evidence suggests potential effectiveness of brief interventions, transferability to the Austrian PMCU faces substantial limitations. Methodological limitations include information loss from umbrella reviews and survey constraints (n=10, limited representativeness). Study intervention durations may not align with short counselling times. Most studies originated from the USA, where healthcare systems and population characteristics differ substantially from those in Austria. Clinical relevance remains uncertain (e.g., whether consuming 0.45 fruit servings/day provides health benefits; the effects on morbidity and mortality were not examined). Brief follow-up periods (≤12 months, often weeks) limit conclusions about sustainability.

transferability limitations; methodological constraints; duration + geographic mismatch; clinical relevance unclear, missing long-term data

Directly transferring results without considering contextual differences could limit the effectiveness of interventions in Austria; therefore, accompanying research would be essential. Future research should particularly validate the effectiveness of follow-up sessions for physical activity counselling through direct comparisons of single-session versus follow-up interventions. Additional priorities include longitudinal studies examining sustained behavioural changes and health outcomes, development of Austrian-specific implementa-

research needs: PA FU-Sessions, longitudinal studies; Implementation strategies needed (guideline)

tion strategies, guidelines with decision support systems for referral pathways (e.g., adapted Healthy Eating Index for nutrition counselling), and exploration of digital tools for lifestyle counselling.

practice-standards gap

The survey revealed a potential gap between current practice and PMCU standards, with physicians not mentioning recommended instruments and citing outdated techniques.

multimodal approach needed: enhanced collaboration, referral pathways, time allocation, remuneration, multilingual materials, macro-level public health interventions

The complexity of lifestyle-related diseases requires multimodal approaches, e.g., enhanced collaboration with dietitians through structured referral pathways, extended time allocation, appropriate remuneration frameworks, and multilingual materials at the micro level, as well as measures improving health literacy, systematic strategies to reach underserved populations requiring PMCU, and addressing social, commercial, and physical environmental factors driving unhealthy behaviours through public health measures at the macro level.

Conclusion

evidence suggests effectiveness; quality varies; implementation barriers exist; multimodal approach necessary (particularly PA + HD); further research essential

While evidence suggests potential effectiveness, particularly follow-up sessions for physical activity, tailored feedback with action planning for a healthy diet, and motivational interviewing for alcohol consumption, evidence quality varies, long-term effectiveness is uncertain, and substantial implementation barriers exist in Austrian primary care. Implementation of adapted interventions appears most relevant for physical activity and healthy diet counselling; alcohol brief interventions already align with PMCU standards. A multimodal approach is necessary, including, for example, structural adaptations, time extensions, training, appropriate remuneration frameworks, interdisciplinary collaborations, and public health measures. Accompanying research is essential to validate follow-up sessions for physical activity, assess long-term effectiveness, and develop Austria-specific strategies, especially for healthy diet counselling.

1 Introduction

Österreichische Vorsorgeuntersuchung (VU): Krankheitsrisikoreduktion + Früherkennung ab 18 Jahren

medizinische Untersuchung + Lebensstilberatung

The preventive medical check-up program was introduced in Austria in 1974 [1]. In the national context, preventive medical check-ups (PMCU) aim to avoid health risk factors (primary prevention) and detect diseases early (secondary prevention). Particular emphasis is placed on cardiovascular diseases (CVD) and cancer, which are among the most common causes of death in Austria [2]. To sustainably improve the health of the population, the program targets all individuals aged 18 and over whose primary residence is in Austria [2, 3]. The program is mainly carried out by general practitioners and specialists in internal medicine and is offered once a year, free of charge, includes a consultation to discuss the medical results and perform lifestyle counselling (LsC). Table 1-1 outlines the key elements of the annual health check for all age groups and genders [1, 4]:

Table 1-1: PMCU categories

Component	Purpose/Details
Medical history	Record family history, medications and lifestyle habits, risk factors
Blood & urine tests	Blood test: sugar, cholesterol, triglycerides, gamma-GT, haemoglobin Urine test: leucocytes, protein, glucose, nitrites, urobilinogen, blood
Physical examination	Comprehensive physical assessment of the skin, neck (including the thyroid gland), heart, lymph nodes, lungs, abdomen, joints, spine, and blood circulation, as well as measurements of blood pressure, BMI and waist size
Periodontal examination	
Discussion of findings and counselling	Review findings and provide advice on health and prevention strategies at a follow-up appointment, which is scheduled after completion of the initial health check-ups

Abbreviations: BMI … Body-Mass-Index, GT … Gamma-Glutamyltransferase

Alters-/ Geschlechterspezifische Untersuchungen

Depending on age and gender, further examinations are recommended, including a cervical smear, mammogram, prostate examination, colonoscopy and hearing and vision tests [4, 5], which will not be discussed further here. People who attend the PMCU do so on average every three years [5].

Inanspruchnahme: 17,5 %

In 2023, 17.5% of the Austrian population took advantage of a PMCU, representing a 14.9% increase compared to the previous year [6]. There was a gender-specific difference: women (18.3%) used the service more frequently than men (16.6%) [3].

~5 % öffentlicher Präventionsausgaben

Public expenditure on general preventive measures totalled €1,877 million in 2023, which corresponds to 4.64% of the annual public health expenditure [7]. The costs for the PMCU health screening amounted to approximately €201 million, which represents 10.71% of the total costs in health prevention [3].

Letztes Update: 2005; Kritik + Weiterentwicklungsbedarf aufgrund fehlender Standardisierung + Individualisierung

The last update of the screening program took place in 2005 [8], and the Federation of Social Insurances is currently in the process of revising the included screening services. Although a scientific revision was conducted in 2020, it was not implemented [9, 10]. In 2023, the Austrian Court of Auditors (ACA) assessed the PMCU as a fundamentally effective tool for the early detection of diseases and identification of risk groups. However, criticism was expressed at the low participation rate and the inadequate quality of documentation, which prevents evidence-based management and further development of pre-

ventive measures [11]. The report also referred to a university study which showed that participants appreciated the PMCU for early detection and health maintenance but criticised the lack of standardisation and the lack of individualised examinations [11].

The most recent evidence-based recommendations for revising the PMCU [12] date from 2022 and are based on guidelines from renowned international institutions in the United Kingdom, Canada and the United States. In accordance with these international guidelines, the current recommendations for revising the Austrian PMCU comprise 26 interventions for 20 target diseases or risk factors. These measures form part of the second PMCU session of consultation, and are designed to prevent lifestyle-related diseases.

2022: evidenzbasierte Empfehlungen zur Überarbeitung (26 Maßnahmen; 20 Zielerkrankungen/ Risikofaktoren

1.1 Lifestyle-related diseases

Lifestyle-related diseases are understood as a subgroup of noncommunicable diseases (NCDs) that arise from genetic, physiological, environmental and behavioural factors and are characterised by long-term or chronic health consequences and a lack of infectivity [13]. The defining feature of this subgroup is its link to an unhealthy lifestyle. They are mainly associated with four risk behaviours [14]:

- unhealthy diet
- lack of exercise
- alcohol consumption
- smoking

Lebensstilbezogene Erkrankungen: nicht-übertragbare Krankheit (NCD) aufgrund ungesunden Lebensstils

v. a. ungesunde Ernährung, Inaktivität, Alkoholkonsum, Rauchen

CVD, stroke, diabetes and certain types of cancer are strongly associated with lifestyle factors and are therefore referred to as lifestyle-related diseases [14].

Kardiovaskuläre Erkrankungen (CVD), Schlaganfall, Diabetes, Krebs

1.1.1 Burden of disease and mortality

The number of deaths and disability-adjusted life years (DALYs) due to NCDs has risen steadily since 1980 (up to records in 2021) [15], largely driven by an increase in size and age of the population [16]. In 2021, NCDs accounted for approximately 43 million deaths worldwide, representing a 64% share. The four main NCDs account for approximately 52% of cases, including CVD (~29%), cancer (~14%), chronic respiratory diseases (CRD, ~6%), and diabetes mellitus (DM, ~2%) [15]. These four diseases account for 80% of premature NCD deaths (before the age of 70), which particularly affect middle- and low-income countries (73% of NCD deaths) [13]. In addition, NCDs accounted for almost 60% of DALYs, with around half of these attributed to the four main diseases [15].

NCD: 64 % aller Todesfälle + 60 % verlorener gesunder Lebensjahre (DALY) weltweit (v. a. CVD, Krebs, chronische Atemwegserkrankungen, Diabetes)

In Austria, the number of deaths from NCDs fell continuously until 2006, but then rose again, almost reaching the number of cases seen in 1980. A similar trend was observed in the number of DALYs, but the number of years of disability-adjusted life years in 2021 actually exceeds the number in 1990 [15]. According to the Global Burden of Disease Network [15], 73,265 deaths in Austria in 2021 were attributable to NCDs, accounting for around 82% of all deaths. Of these, ~33% were attributed to CVD, ~24% to cancer, ~4% to CRD,

Ö 2021: Anzahl DALY angestiegen; 82 % aller Todesfälle aufgrund von NCDs; Ö 2022: CVD + Krebs für 6 von 10 Todesfällen verantwortlich

and ~2% to diabetes. Austrian health statistics [17] also showed that, in 2022, CVD caused 32,000 deaths (34.3%), while cancer caused 21,170 deaths (22.7%). Together, these accounted for almost six in ten deaths [17]. Almost 75% of deaths under the age of 70 were from NCDs, with ~17% from CVD and ~37% from cancer. Furthermore, NCDs account for 82.25% of total DALYs and ~80% of DALYs among those under 70 in Austria [15].

1.1.2 Risk factors

gesteigertes Sterberisiko: z. B. Rauchen, körperliche Inaktivität, schädlicher Alkoholkonsum, ungesunde Ernährung

According to the World Health Organisation (WHO) [13], the use of tobacco, physical inactivity, the harmful use of alcohol, unhealthy diets, and air pollution have been identified as factors that increase the risk of dying from an NCD. The initial four factors are those which have been associated with an unhealthy lifestyle and, consequently, lifestyle-related diseases. Bovet et al. [18] present data on the proportion of the four major NCDs and global mortality, broken down by risk factors (see Table 1-2).

Table 1-2: Fractions of the global mortality from the four major NCDs, modified from Bovet et al. [18] (in %)

	CVD	Cancer	CRD	Diabetes
Behavioural risk factors				
Tobacco	17.2	25.8	45.4	
Dietary risks	37.0	6.0		25.2
Low physical activity	3.4	0.7		8.1
Alcohol use	2.3	4.9		
Unsafe sex (e.g. leading to HPV transmission, causing cervical cancer)		2.8		
Drug use		5.2		
Metabolic factors				
High blood pressure	53.8			
High blood LDL-cholesterol	23.7			
High fasting blood glucose	20.3	4.2		
High body mass index	17.4	4.6	1.9	40.7
Environmental factors				
Air pollution	19.1	3.9	33.1	19.3
Other	4.6			
Occupational risks		3.3	14.6	

Abbreviations: CVD … Cardiovascular diseases, CRD … Chronic Respiratory Disease, HPV … Human Papillomavirus, LDL … Low-Density Lipoprotein

Kategorisierung Risikofaktoren

The classification is divided into three distinct categories: behavioural, metabolic and environmental risk factors. Tobacco, dietary risk, low physical activity and alcohol use are classified as **behavioural risk factors** [18], which play a pivotal role in the development of lifestyle diseases.

Verhalten in Ö: Tabakkonsum, physische Aktivität (PA), gesunde Ernährung (HD) gesunken, Alkoholkonsum (AC) konstant seit 2014

In Austria, the number of **tobacco** users has decreased since 2014 [19]. Nevertheless, 20.6% of people in private households aged 15 and over smoke daily, with 23.5% of these being men and 17.9% being women [20]. In line with WHO recommendations[1] for **physical activity** (PA), the proportion of the population in private households aged 18 to 64 engaging in endurance and muscle-strengthening activity has fallen to 23.6% in 2019, compared to 2014 [21]. Daily consumption of fruit and vegetables is considered an indicator of a **healthy diet** (HD) because it is a vital part of a balanced diet and tends to reduce the consumption of less healthy foods. In 2019, the daily consumption of fruit and vegetables was 49.9% and 47.3% of the Austrian population, representing a decrease compared to 2014. Women consume more fruit and vegetables (58.7% and 55.4%) than men (40.7% and 38.9%). Conversely, daily meat and sausage consumption (32.6%) is higher among men (43.9%) than women (21.8%) [22]. Furthermore, in 2019, one tenth of the Austrian population aged 15 and over were classified as risky **alcohol consumers** (14.8% men; 5.3% women), which equates to 16 g of pure alcohol per day for women (~0.18 L of wine) and 24 g for men (~0.27 L of wine). Harmful alcohol consumption (AC), defined as a daily intake of 40 g for women and 60 g for men, was identified in 1.6% of the population (2.7% of men and 0.6% of women). Consumption levels have remained relatively stable since 2014. The authors of the health survey highlight the potential biases associated with self-reporting by respondents and socially desirable response behaviour, particularly with regard to AC [19].

It is essential to recognise that the primary drivers of these behaviours are social, commercial, and physical environment (e.g., **environmental factors**) [23].

Verhalten beeinflusst metabolische Risikofaktoren

Furthermore, behavioural risk factors contributing to **metabolic factors** that increase the risk of NCDs include raised blood pressure, overweight/obesity (high body mass index), elevated blood glucose levels (diabetes), and abnormal blood lipids (high cholesterol) [13].

Ö 2019: ca. 1/5 mit erhöhtem Blutdruck; 1/3 übergewichtig

According to the Austrian Health Survey 2019, 1.6 million people – representing 22% of the population aged 15 and older – reported suffering from **high blood pressure**. Elevated cholesterol levels, blood lipids, or triglycerides affected 19% of the population, while 6% had a diagnosed case of diabetes [19]. 34.5% of the population aged 15 and over were classified[2] as overweight, and 16.6% were obese, representing an increase from the 2014 statistics. A proportion of only 46.6% of the population was of normal weight [24].

[1] WHO recommendations: at least 150 minutes of moderate-intensity exercise per week and training to build muscle on at least two days per week for people aged 18 to 64 years [21].

[2] WHO classification of adults according to BMI: underweight (BMI < 18.5), normal weight (18.5 to 24.9), overweight (25.0 to 29.9) and obese (BMI ≥ 30.0) [24].

1.2 Lifestyle-related health check-up

VU zur Erkrankungsreduktion

An approach that considers *health in all policies* can contribute to the overall societal goal of reducing risk factors for NCDs. However, the management of these diseases falls within the remit of the health sector, including the detection, screening, and treatment of NCDs [13]. Periodic health examinations, also known as 'check-ups', can contribute to this goal.

Zwei Komponenten: Screening + Beratung

Check-ups are designed to identify behavioural, physical and metabolic risk factors among people who appear to be healthy and enable discussion about reducing exposure to risk factors [25]. They therefore typically comprise two components: screening and counselling.

Screening: Systematische Testung auf Risikofaktoren

Screening Nachteile

Screening is the systematic offering of tests to apparently healthy individuals or population groups to identify those at increased risk of developing specific diseases, to offer them early treatment or interventions to reduce their risk and improve their health [26, 27]. Disadvantages, including false-positive results, overdiagnosis and overtreatment, often accompany screening. Therefore, only screening programmes that offer more benefits than harm are recommended [26, 28]. Early detection and treatment primarily take place as part of routine clinical practice and general health examinations [27].

Lebensstilberatung, v. a. Risikogruppen

Counselling is usually provided in relation to healthy lifestyle choices, such as PA, HD and reduction of AC, but especially to those who have been identified as being at increased risk of cardiovascular disease (CVD) during screening [25]. A wide range of counselling frameworks, behavioural change techniques and delivery modes are available. The most appropriate and relevant tools for PMCU are listed in the Table 1-3. Depending on the reference, variations in definitions may be observed.

Table 1-3: PMCU tools

Intervention	Explanation	Reference
Counselling framework		
Very brief intervention	■ 30 seconds to a couple of minutes ■ giving people information or a referral to support services ■ raising awareness of risks or support for change ■ 'ask, advise, assist' structure	[29]
Brief Intervention	■ few minutes for basic advice ■ oral discussion, negotiation or encouragement ■ with or without written or other support or follow-up ■ referral for further interventions	[29]
Extended brief intervention	■ > 30 minutes ■ single session or multiple brief sessions ■ individually-focused discussion	[29]
Motivational Interviewing	■ therapeutic approach ■ set of techniques and counselling style ■ mobilising intrinsic client values and goals for behaviour change ■ client-centred counselling ■ systemic approach (consideration of social determinants) ■ client-generated motivation rather than externally imposed change	[30, 31]
Tailored intervention	■ tailored to the client's needs and circumstances (e.g. physical and mental health, physical, social, economic environment) ■ appropriate tools for the specific population or setting	[29]

Intervention	Explanation	Reference
Behavioural change technique		
Goals and (action) planning	■ technique helping people to set and achieve goals ■ action plans include specific details: activity description, timing/situation, frequency, duration, and location ■ continuous monitoring of goal progress	[29]
Feedback and monitoring	■ Recording a specific behaviour or outcome ■ objective feedback on behavioural data, measurable outcomes, and goal attainment progress ■ self-monitoring or by a third party	[29]
Shaping knowledge/education	■ nutritional label ■ reading ■ resistance training booklet for home-based exercise ■ lecture/workshop about exercise recommendations ■ online education modules ■ written 'six-tip diet' checklist	[32]
Delivery mode		
Face-to-face	N.A.	[33]
Group counselling	N.A.	[33]
Telephone	N.A.	[33]
Printed material	N.A.	[33]
Web-based/E-mail counselling	N.A.	[33]
Text messages	N.A.	[33]

Abbreviation: N.A. … Not applicable

1.3 Austrian lifestyle-related health check-up

stärkere Beratungsrolle von Ärzt:innen seit VU Einführung

Free PMCU were introduced in Austria in 1974. Since then, the programme and the role of doctors have evolved, with doctors now playing a much stronger advisory role. They are increasingly expected to consider patients' living conditions and provide personalised guidance on issues such as quitting smoking, nutrition, and physical activity [1]. This highlights the relevance of lifestyle in Austrian PMCU, as reflected in the screening measures and counselling provided.

adressierte Risikofaktoren durch VU

Table 1-4 shows the risk factors for NCDs identified by Bovet et al. [18], which are associated with lifestyle and are either addressed (✓) or not addressed (✗) by the recommendations for PMCU in Austria [8, 12]. The risk factors addressed in PMCU are reflected in the guidelines for physicians performing PMCU [1], which aim to prevent cardiovascular and metabolic diseases, as well as addictive disorders.

Table 1-4: NCD risk factors addressed by the Austrian PMCU

NCD risk factors (Bovet et al. [18])	Austrian health check-up [8, 12]
Behavioural risk factors	
Tobacco	✔ – Nicotine/tobacco consumption
Dietary risks	✔ – Overweight/obesity
Low physical activity	✔ – Physical activity
Alcohol use	✔ – Alcohol consumption
Unsafe sex	✘
Drug use	✘
Metabolic factors	
High blood pressure	✔ – Hypertonia
High blood LDL-cholesterol	✔ – Lipid metabolism disorder
High fasting blood glucose	✔ – Diabetes mellitus Type 2
High body mass index	✔ – Overweight/obesity

1.3.1 Lifestyle screening

Screening-Empfehlungen für Erwachsene

Table 1-5 shows the lifestyle-related screening recommendations and intervals for the Austrian health check-up [12]. These measures are recommended for adults aged 18 years and above. Physical activity is not specifically screened, but is determined and addressed annually during a consultation (see following chapter) [12].

Table 1-5: Lifestyle-related screening measures and intervals

Disease/Risk factor	Screening	Screening interval
Nicotine/tobacco consumption	Assessment of smoking status using the 5 As questionnaire	At every PMCU
Overweight/adiposities	BMI and/or waist circumference as part of the physical status assessment	At every PMCU (BMI and/or waist circumference)
Physical activity	✗	✗
Alcohol consumption	AUDIT-C self-administered questionnaire, individual question	At every PMCU
Hypertonia	Blood pressure measurement	Individually tailored
Lipid metabolism disorder	Total cholesterol, HDL, LDL cholesterol ratio, triglyceride determination	5 years (without increased risk), individually tailored (with increased risk)
Diabetes mellitus Type 2	Determination of diabetes risk using FINDRISK HbA1C, glucose tolerance test	3 years (determination of fasting blood sugar, HbA1C)

Abbreviations: PMCU … Preventive medical check-up, BMI … Body mass index, HDL … High-Density Lipoprotein, LDL … Low-Density Lipoprotein, HbA1C … Hämoglobin A1c

1.3.2 Lifestyle counselling

Lebensstilberatung (LsC) zur Prävention + Gesundheitsförderung

As an integral part of PMCU in Austria, LsC has the potential to prevent certain diseases and improve public health more broadly, thereby serving preventive and health-promoting purposes [1, 34]. This counselling is based on an assessment of the risk of cardiovascular and metabolic diseases. If certain risk requirements are exceeded, as determined during the screening, the physician will provide lifestyle counselling relating to diet, alcohol consumption or tobacco use. Regardless of whether a specific threshold value for risk factors has been determined, advice on PA is given at every PMCU appointment. The counselling is supported by various tools, depending on the counselling target, which are explained below. Table 1-6 summarises the lifestyle-related risk factors, the related PMCU target [1, 34], PMCU counselling, and the interval for conducting [12]. The counselling aspects and tools listed in the table and relevant to this report (Five A's, motivational interviewing, advice on physical activity, AUDIT questionnaire, non-pharmacological interventions, and risk board) are explained in greater detail below.

Schwellenwerte für Beratung

Aktivitätsempfehlung bei jeder VU

Table 1-6: Lifestyle-related counselling and intervals

Disease/Risk factor	PMCU target	Counselling	Requirements	Counselling interval
Nicotine/tobacco consumption	Cessation of tobacco use	Smoking cessation counselling (**Five As**; **motivational** prompts, referral to a specialised smoking cessation facility)	Smoker or recent cessation of smoking	At every PMCU
Overweight/ obesity	Reducing overweight	Support weight reduction (nutritional advice, **advice on PA** supported by behavioural therapy techniques)	BMI >25 kg/m^2 with comorbidities or >30 kg/m^2	Annually (advice for BMI >25 kg/m^2)
Physical activity	Reducing physical inactivity	Consultation to **motivate** regular **PA** in everyday life (**Five As**)	Everybody	At every PMCU
Alcohol consumption	Cessation of AC	Weaning counselling, referral to specialised treatment for alcoholism	Points on **AUDIT-Questionnaire** > 4 points in woman > 7 points in men	At every PMCU
Hypertonia	Prevention of high blood pressure	**non-pharmacological therapeutic interventions** according to **risk board**	N.A.	Individually tailored
Lipid metabolism disorder	Prevention of lipid metabolism disorders	Counselling according to **risk board**	N.A.	✗
Diabetes mellitus Type 2	Prevention of diabetes mellitus	✗	N.A.	✗

Abbreviations: PMCU … Preventive medical check-up, BMI … Body-Mass-Index, AC … Alcohol consumption, N.A. … Not applicable

Counselling for cardiovascular risk

Tafel zu CVD-Risiko-Bestimmung

The assessment of cardiovascular risk is conducted through the utilisation of a **risk board**, which employs a scale ranging from 0 (low risk) to 11 (high risk). The evaluation encompasses various factors, including PA, smoking status, family history, BMI, total cholesterol, and systolic blood pressure.

Non-pharmacological therapeutic interventions aim to reduce the five-year risk of a cardiovascular event to below 15 per cent. Table 1-7 defines the treatment goals of PMCU in the guidelines for physicians by the Federation of Social Insurances, which are more likely to be achieved if several risk factors are addressed simultaneously [1, 35]. The following counselling techniques can be utilised to facilitate this process.

nicht-medikamentöse Interventionen + Ziele

Table 1-7: Non-pharmacological interventions

Intervention	Target
Weight optimisation	Normal body weight (BMI 18.5–24.9 kg/m²)
Dietary measures	Vegetables, fruit, healthy fats
Sodium restriction	Sodium intake < 100 mmol/day (< 6 g table salt/day)
Physical activity	Daily aerobic physical activity – at least 30 minutes (e.g. brisk walking)
Moderate alcohol consumption	Men ≤ 30 g ethanol/day, women ≤ 20 g ethanol/day. Small amounts of alcohol may have a protective effect* (**It* is important to note that this assumption is controversial, as current evidence – including WHO's statement that no amount of alcohol is safe – advises against alcohol consumption as a preventive measure[36, 37])
Smoking cessation	Additional reduction in cardiovascular risk

Abbreviations: BMI … Body-Mass-Index, mmol … millimoles per liter, WHO … World Health Organization

Counselling for physical activity, alcohol, and tobacco use

In the case of an identified risk by the CVD risk board, LsC is provided on PA, HD, and, if applicable, smoking cessation. The intensity of the counselling is directly proportional to the risk category [1, 35].

PA-, HD-, Rauch-Beratung nach CVD Risikotafel

A handbook [38] outlining a structured communication approach of **5 As** is available to support primary care staff in providing practical counselling on nutrition (including overweight), PA, alcohol, and tobacco use. The model promotes the joint development of a tailored action plan and is better suited to ongoing, structured counselling processes than to one-off consultations [23]. It consists of the following steps:

5As Beratungsansatz für maßgeschneiderte Aktionsplanung

1. **Ask** – Ask questions
2. **Assess** – Assess and evaluate the current situation and motivation
3. **Advise** – Provide recommendations
4. **Assist** – Offer support and resources
5. **Arrange** – Provide follow-up and ongoing support

The counsellor's attitude should be open, attentive, and empathetic, in line with the four core **principles of motivational interviewing** [38]:

Beraterhaltung + Prinzipien motivierender Gesprächsführung (MI)

- **Resist:** Resist the reflex to correct the patient.
- **Understand:** Understand the patient's motivations.
- **Listen:** Listen carefully to the patient.
- **Empower:** Empower the patient.

Counselling for physical activity is aimed at all target groups of the preventive health examination, regardless of existing risk factors. Its goal is to prevent obesity, coronary heart disease, arterial hypertension, and diabetes mellitus. Individuals are encouraged to engage in moderate daily PA, with a week-

PA-Beratung erfolgt risiko-unabhängig

PA-Empfehlung

ly energy expenditure of 1,000 kilocalories. The recommended optimum is an average energy expenditure of 2,000 kilocalories per week through exercise [1, 35].

Counselling on alcohol consumption

AUDIT-Fragebogen (AC); risikoabhängige Beratung

In instances where concerns regarding alcohol consumption necessitate intervention, the risk is ascertained through the utilisation of the **AUDIT questionnaire**. A basic counselling session is provided for women with 5-15 AUDIT points and men with 8-15 AUDIT points. A detailed counselling session, with a subsequent follow-up appointment, is offered for individuals with 16-19 AUDIT points. Scores within the 20-40 range typically result in referral to specialised alcoholism treatment services [1, 34].

1.4 Research objective and research question

gleichbleibender Tabak-/Alkoholkonsum; verschlechterte PA + HD

Despite the availability of PMCU guidelines and communication tools, Austria's dietary and physical activity patterns have worsened in recent years. Tobacco use among men and AC in general remain at the EU average, while tobacco use among women is even above average. Furthermore, every second person in Austria demonstrates limited health literacy [39]. These developments underscore the need to assess the extent to which LsC contributes to improving population health in Austria and how practitioners can be more effectively supported in delivering effective counselling.

Berichtziel

This initial report, therefore, aims to systematically identify lifestyle-related brief interventions (BI) targeting PA, HD, and AC; to comparatively analyse their effectiveness; and to exploratively assess their feasibility for implementation within the Austrian PMCU programme.

Forschungsfragen (FF)

The subsequent research questions (RQ) will be addressed, the results of which will contribute to the development of evidence-based recommendations for optimising preventive medical check-ups in Austria:

- **RQ1:** What evidence-based brief interventions (e.g. communication models, practical tools) are used in studies on lifestyle counselling for physical activity, nutrition, and alcohol consumption?
- **RQ2:** How effective are the identified interventions and their specific characteristics (e.g. trained intervention) in comparison to each other in improving lifestyle change among recipients?
- **RQ3:** What are the implementation requirements and barriers for lifestyle-related brief interventions within the Austrian preventive medical check-up?

FF1: evidenzbasierte Kurzinterventionen (BI): PA, HD, AC

FF2: Wirksamkeitsanalyse identifizierter BI

FF3 Implementierungshürden und -bedarfe

Protokollregistrierung

To address the first two research questions, a systematic review will be conducted. The final research question will be addressed through the implementation of an empirical study. The research project was pre-registered on the Open Science Framework (OSF) platform [40] (registration DOI: 10.17605/OSF.IO/NZ3D8).

2 Methods

2.1 Umbrella review

Umbrella review nach PRISMA; keine Protokollabweichungen

To answer RQ1 and RQ2, we conducted an umbrella review of systematic reviews following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [41]. No deviations were made from the pre-registered protocol. However, the RQ1 was defined more precisely, and the eligibility criteria were refined to address the heterogeneity of the available evidence. Definitions of eligibility criteria were based on the structure of the Austrian PMCU to ensure transferability to this context.

Literature search

3 Datenbanken (2015-2025)

793 eingeschlossene Artikel

Handsuche

We systematically searched, in collaboration with the institutional information specialist, the following databases on May 26, 2025: Medline via Ovid, Embase, and The Cochrane Library. Article languages were not restricted. As lifestyle counselling is a relatively new concept, it is not appropriate to consider studies that are more than 20 years old. Assuming that reviews should include studies published within a period of at least ten years, we deemed a ten-year search period to be appropriate. Accordingly, the systematic search was limited to articles published from 2015 to 2025. Furthermore, conference abstracts in Embase and study records from study registers in the Cochrane Library were excluded from the search. After deduplication, a total of 793 citations were included. The specific search strategy employed is outlined in Appendix-IV. We hand-searched the reference lists of the included and some potentially relevant hits to identify further reviews.

Study selection

PICOS-Kriterien: Fokus auf Kurzinterventionen

The study selection followed the Population, Intervention, Comparator, Outcome, Study (PICOS) framework, as outlined in Table 2-1. We excluded studies published in languages other than English or German.

Table 2-1: Eligibility criteria

PICOS	Included	Excluded
Population	Recipients of lifestyle-related BIs in counselling settings.	
Setting	Reviews including studies from primary health care settings or primary health care settings and other settings	Reviews including studies from other than primary health care settings alone, such as school-based, workplace, community-dwelling, college campuses, and pharmacies
State of health	Reviews including studies among (I) healthy persons, (II) persons with lifestyle-associated risk factors for specific diseases (e.g., CVD risk factors) or (III) existing lifestyle-associated chronic diseases (e.g., CVD, type-2 diabetes)	Reviews including studies among persons with non-lifestyle-related diseases
Interventions	BI (measures, programs, tools, communication guidelines) for LsC on: ■ Physical activity ■ Healthy diet ■ Alcohol consumption Aiming to prevent diseases, reduce risk factors, or prevent worsening of disease	

PICOS	Included	Excluded
Brief	Reviews need to define interventions as 'brief' or 'very brief/minimal' and report on the number of sessions (≤5 sessions)	Reviews which do not define interventions as 'brief' or 'minimal' or do not provide the number of sessions (e.g. multiple sessions)
Intervention	Reviews, including studies with BI conducted by medical staff (alone or with electronic support)	Reviews including studies of electronic intervention alone/application without personal interaction
	Reviews including studies with face-to-face interaction	Reviews including studies focusing on DIGA, chat-bots, smartphones, internet-based only
Prevention	Primary or secondary prevention	treatment, rehabilitation
Comparator	Comparison of BIs and/or their parameters against each other (or against standard of care, if reviews comparing interventions are unavailable)	Reviews comparing different effectiveness on different time points only
BI	Reviews comparing different BIs against each other	N.A.
Standard of care	Reviews comparing BI vs other interventions (e.g. multiple interventions >5 sessions)	N.A.
Outcome		
Research Question 1:	■ Lifestyle-related BIs on PA, HD, and AC ■ Characteristics of the BIs	N.A.
Research Question 2:	Comparative effectiveness of lifestyle-related BIs on PA, HD and AC, e.g. in relation to, but not limited to: ■ Behavioural changes of the recipients (e.g. food intake, physical activities/daily movement, consumption-free days, etc.) ■ Improvement of parameters indicating risk reduction (e.g. blood sugar, cholesterol, nutrients, BMI, etc.) ■ Improvement in (e.g. nutrition-related) quality of life and emotional well-being	N.A.
Studies		
Design	Systematic Review + Meta-analysis, Cochrane Review, Systematic review, Umbrella review, Rapid review, Scoping review	Guidelines, literature review without systematic search
Countries	Reviews focusing on Western countries/high-income countries. That means, if the majority of included studies in the review are from high-income/western countries, the review is included.	Reviews focusing on low- and middle-income countries or non-Western countries alone will be excluded

Abbreviations: BI … Brief intervention, CVD … Cardiovascular disease, LsC … Lifestyle counselling, DIGA … Digital Health Applications (Digitale Gesundheitsanwendung), PA … Physical activity, HD … Healthy diet, AC … Alcohol consumption, BMI … Body-Mass-Index, N.A. … Not applicable

Studienauswahl durch 2 Autorinnen

According to the eligibility criteria, two independent reviewers (JAP, LG) initially screened the titles/abstracts, and then the full texts of the retrieved records, while exclusion was based on specific reasons (see Figure 2-1).

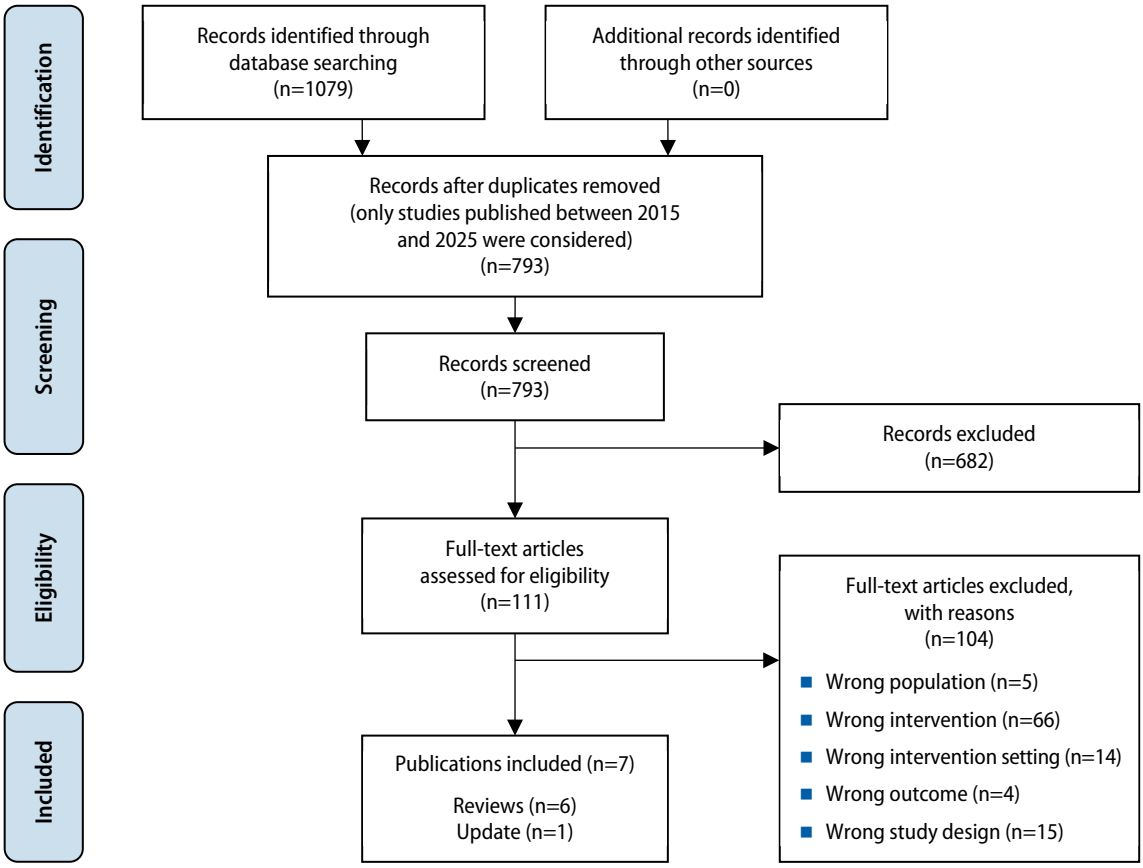

Figure 2-1: Description of the selection process (PRISMA Flow Diagram)

Data extraction, quality assessment and synthesis

Datenextraktion durch zwei Autorinnen; Qualitätsbewertung mittels ROBIS

Data describing study characteristics (e.g., study design, number of participants, sex, defined BI, settings, and countries), intervention details (outcome RQ1), and effectiveness endpoints (RQ2) were extracted by one reviewer (JAP) onto a predesigned form according to Smith et al. [42]. Data extraction was double-checked by a second reviewer (LG). All included reviews were critically appraised by two reviewers (JAP, LG) using the ROBIS tool for assessing risk of bias of systematic reviews [43]. For each of the above steps, any disagreements were resolved through discussion or consultation of a third reviewer (VH).

narrative Synthese nach Beratungstyp

We synthesised results for each research question in a narrative format, differentiated by PA, HD and AC.

2.2 Empirical study

qualitative Expert:innenbefragung

To explore the implementation requirements and barriers for brief lifestyle interventions within Austrian PMCU (RQ3), we conducted a qualitative expert survey. Due to time constraints, we deviated from the protocol, which had envisaged interviews, and instead used questionnaires. Ethics approval was not required because the target group were experts. The reporting of this study adheres to the COREQ (Consolidated Criteria for Reporting Qualitative Research) guidelines [44].

Qualitative survey in PMCU settings

qualitative Inhaltsanalyse eines Online-Fragebogens (8 Kernfragen)

Pretest im AIHTA-Team

The **study design**, based on qualitative content analysis inspired by Mayring [45], allows us to collect the individual experiences, opinions and perspectives of the target group. We conducted a qualitative survey using a standardised questionnaire consisting of open questions [46]. The questionnaire was created inductively based on the research question and structured according to the classic funnel method, including four introductory quantitative questions (Q001-Q004), eight main qualitative questions (6 general PMCU questions Q201-Q206, and 2 specific questions for evidence-based interventions Q301 and Q302) and a concluding question (Q401). The development of qualitative questions followed the rules for formulating qualitative surveys, such as using simple and direct wording, open-ended questions, and avoiding suggestive questions [46]. A pretest was conducted within the AIHTA team (approximately 10 people).

Gezielte Stichproben nach Bundesland + Versorgungstyp

73 kontaktierte Einrichtungen (via E-Mail)

Befragungszeitraum: 5.-29. August 2025

Subsequently, questionnaires (see Appendix-II) were distributed using a purposeful **sampling** approach [47, 48], focusing on particularly meaningful cases. To represent the setting of practising physicians performing PMCU as comprehensively as possible, we employed a qualitative sampling plan [46] based on the key characteristics of the Austrian federal state and type of care (PMCU centre, primary care centre, individual/group practice). The corresponding cases were identified using the search and filter function of the Austrian social security provider [49]. To be included in the contact list, practices had to offer PMCU on their website and be contactable by email. Starting on 5 August 2025, one case per federal state and type of care was initially contacted by email (see the recruitment E-Mail Appendix-III). Due to the low response rate, the sample was steadily expanded throughout the survey period (see the recruitment list in *Supplemental material* – Expert consultation). The email contained a link and QR code to the online survey (created via LimeSurvey.org), which was active until August 29, 2025. A total of 73 practices and centres offering PMCU were contacted.

Data analysis and quality assessment

deduktiv-induktive Inhaltsanalyse mit MaxQDA; Intercoder-Reliabilität der Hauptcodes: 97,8 %

5 Hauptcodes (deduktiv); 12 Subkategorien (induktiv) …

The descriptive data were displayed directly using Limesurvey. The results obtained from the qualitative inquiries were transferred to and subsequently analysed in MaxQDA. Questionnaires were anonymised and assigned an ID (ID001-ID014) for the purpose of evaluation during the transformation process. The analysis employed a deductive-inductive approach to qualitative content analysis, as outlined by Kuckartz and Rädiker, 2022 [50]. Through a deductive process, five primary categories were derived from the questionnaire with the objective of addressing research question 3. The material was coded by two coders, who achieved an intercoder-reliability of main codes of

09.78%, with a minimum code overlapping rate of 90% at the segment level (in other words, the tolerance for non-overlap is 10%). The resolution of all outstanding disagreements was achieved through the utilisation of a dialogue-based approach. Subsequently, the subcodes were developed by one coder (JAP), resulting in a total of 12 subcodes. In concluding this study, a category-based narrative synthesis was conducted, incorporating both frequency analysis (quantitative) and descriptive analysis (qualitative). Beside narrative description, we used direct quotes from the interviews (presented in blue boxes) to present and support the results, but corrected the spelling.

… Frequenzanalyse (quantitativ) + deskriptive Analyse (qualitativ)

2.3 Quality assurance

As part of the quality assurance process, the report was reviewed by one internal reviewer (IZK) and one external reviewer (HB).

Interner + externer Review zur Qualitätssicherung

The external reviewers were asked to assess the following quality criteria:

- Technical correctness: Is the report technically correct (evidence and information used)?
- Does the report consider the latest findings in the research area?
- Adequacy and transparency of method: Is the method chosen adequate for addressing the research question, and are the methods applied transparently?
- Logical structure and consistency of the report: Is the report's structure consistent and comprehensible?
- Formal features: Does the report fulfil formal criteria of scientific writing (e.g. correct citations)?

technische Korrektheit, Aktualität, Methodentransparenz, Struktur, formale Kriterien

The AIHTA considers external peer review by scientific experts from different disciplines to be a quality assurance method for scientific work. The responsibility for the report content lies with the AIHTA.

3 Results

3.1 Umbrella review

In the systematic review aimed at answering RQ1 and RQ2, which sought to determine which evidence-based BIs are used in LsC and which interventions, along with their characteristics, are effective, we included a total of seven publications on six reviews. Table 3-1 provides an overview of the identified systematic reviews. Out of the six included systematic reviews, one each measured BI for PA and HD, while four examined BI for AC. The characteristics are listed in the *Supplemental material* – Dataextraction.

7 Publikationen (6 Reviews): 1x PA, 1x HD, 4x AC

Table 3-1: Included studies

Counselling type	ID	Author, year [Reference]	Review type	Synthesis
Physical activity	ID1	Lamming et al., 2017 [51]	Umbrella review	Narrative synthesis
Healthy diet	ID2	Whatnall et al., 2018 [52]	Systematic review	Narrative synthesis
Alcohol consumption	ID3	Alvarez-Bueno et al., 2015 [53]	Umbrella review	Meta-analysis
	ID4	Kaner et al., 2018 [54] summarized by Beyer et al., 2019 [55]	Cochrane Review	Meta-analysis
	ID5	Platt et al., 2016 [56]	Systematic review	Meta-regression
	ID6	Boniface et al., 2018 [57]	Systematic review	Narrative synthesis

3.1.1 Lifestyle counselling for physical activity

Study characteristics

The umbrella review on **physical activity** (ID1) [51] involved a narrative synthesis of 16 systematic reviews identified in nine databases in 2015. However, only three out of 16 reviews focused on BI and were therefore considered in the data extraction, quality appraisal and synthesis for this report. One author of the three reviews declared conflicts of interest. For the reasons listed in Table 3-2, the review was deemed to be at high risk of bias (RoB).

1 Umbrella Review (16 SR, 3 mit BI-Fokus); 39 RCTs/NRCTs; 25.493 Teilnehmer:innen (≥18 Jahre)

Table 3-2: Risk of bias of systematic reviews for PA

	Phase 2				Phase 3
Review ID [Reference]	Study eligibility criteria	Identification and selection of studies	Data collection and study appraisal	Synthesis and findings	Risk of bias in the review
ID1 [51]	☺	☹[a,b]	☺[c]	☹[d,e]	☹[f]

Legend: ☺ = *low risk;* ☹ = *high risk;* **?** = *unclear risk*

Rationale:

[a] *Title screening by one reviewer only*

[b] *unblinded abstract and full text screening*

[c] *Number of reviewers collecting data not reported*

[d] *Protocol not available*

[e] *Results from AMSTER tool (including risk of bias) were not considered in the synthesis*

[f] *Concerns of the review not addressed in the interpretation of findings*

The tree BI-Reviews included a total of 25 randomised controlled trials (RCTs) and 14 non-randomised controlled trials (NRCTs) involving 25,493 participants. The population of interest comprised adults aged 18 and above, regardless of their health status. In a small number of studies, a specific target group was specified (individuals undergoing rehabilitation or receiving secondary or tertiary care, those with serious conditions, and athletes). The intervention provider was not specifically defined; however, patients receiving secondary or tertiary care and those requiring specialist support not typically available in primary care were excluded. Outcomes of interest were physical activity or sedentary behaviour (or related proxy measures). Data about the countries in which the RCTs were conducted was not supplied.

Outcomes:
PA + Sitzverhalten

Länder: keine Angabe (KA)

A brief intervention in primary care settings was defined as a maximum of 30 minutes or consisting of a single core consultation and was compared to usual care. The BI of all three reviews was delivered by a primary care practitioner and/or in primary care. All reviews collected self-reported PA (not further defined) as an outcome over a short-term period of 4-12 weeks, and one systematic review (SR) also collected long-term outcomes of 12 weeks or more. The systematic reviews received AMSTAR scores ranging from four to six on an 11-item scale, with a maximum score of 11 indicating high quality and a minimum score of 0 indicating low quality [58].

BI-Definition:
Max. 30 Min. od. Einzelkonsultation der Primärversorgung

Outcome:
Selbstberichtete PA v. a. nach 4-12 Wochen

Brief interventions and their effectiveness

Evidence from the umbrella review (ID1) comprising three systematic reviews on BI indicates that the majority of BI for physical activity is accompanied by written supplementary material. The main differences are in terms of length and FU components. For instance, a BI may last between 2 and 3 minutes (1 SR) or between 7 and 13 minutes (1 SR). Follow-up components include visits, phone calls and newsletters. One study that appears in all reviews stands out for its tailored advice.

3 BI-Reviews;
BI 2 bis 13 Minuten, meist mit schriftlichem Begleitmaterial + Follow-up (FU) Komponente

BI vs. usual care

The results of the umbrella reviews indicated that **BI** on PA was effective in increasing self-reported PA after a period of four to twelve weeks, compared to usual care or the absence of intervention. One of the three systematic reviews also reports an increase after 12 weeks or more, while the remaining two reviews report a lack of evidence regarding long-term outcomes. The narrative syntheses did not provide information on the magnitude of effects, though these appeared to vary across studies (see Table 3-3). Only one of the three reviews [59] provided meta-analytic results, which indicated a small effect of brief advice on self-reported physical activity (SMD 0.17 [95% CI 0.06 to 0.28], I^2 69%). Self-reported physical activity measures included leisure exercise minutes, moderate and vigorous activity minutes per week, walking sessions per week, and the proportion meeting physical activity recommendations. Participants in the brief advice group were 1.3 times more likely to meet the recommended physical activity levels compared to the usual care group (RR 1.30 [95% CI 1.12 to 1.50]) [59]. More detailed information on significance levels can be found in the primary reviews of this umbrella review [51].

BI vs. Standard:
BI effektiv für kurzfristige PA-Steigerung (SMD 0.17; RR 1.30)

The effectiveness of the intervention may be influenced by follow-up sessions, which may be more important than the duration of individual sessions (1 SR) and the provision of written material. However, the evidence here is mixed: one review showed no increase in effectiveness through written material, while

FU wichtiger als Sitzungsdauer;
Evidenz zu Materialien, Anbietern unklar

another described written prescriptions as useful. There is insufficient evidence regarding the influence of the duration of individual sessions (1 SR) or the tailoring of intervention materials, types of providers, provider training, setting or theoretical basis (2 SRs). Objective measures of PA (e.g. data from accelerometers, pedometers, heart rate monitors, or GPS trackers) were not reported by any of the three systematic reviews.

Table 3-3: Summary of findings of BI for physical activity

No. of reviews (ID)	Quality appraisal	No. of pts. (no. of SR)	BI vs. Comparator	Effectiveness
Self-reported physical activity				
1 (ID1)	AMSTAR score: 4-6	25493 (3)	**BI** (max. 30 min. or single consultation) vs. **usual care**	**1 review** **narrative (10 RCTs; 5 NRCTs)** (4-6 weeks to 12 months): 6 studies: sig. posititve effect 7 studies: non sig. positive effect 2 studies: no group difference **MA (6 RCTs; 2 NRCTs)** small effect of BA (SMD 0.17 [95%-CI 0.06;0.28], I^2 69%) **MA (7 RCTs; 2 NRCTs)** meeting recommended physical activity levels (RR 1.30 [95%-CI 1.12; 1.50], I^2 66%), favouring BA possibly influenced by the included written material and FU-session
			BI (max. 30 min. or single consultation) vs. **no intervention**	**1 review (2 RCTs; 6 NRCTs)** (<8 weeks): 4/6 studies: sig. positive effect 1 study: no group difference (≥4 months): 1/4 studies: sig. positive effect 2 study: no group difference
			BI (max. 30 min. or single consultation) vs. **control**	**1 review (7 RCTs; 3 NRCTs)** (6–12 weeks): 3/6 studies: sig. positive effect (>12 weeks): 3/7 studies: sig. positive effect (≥12 months): 3/7 studies: sig. positive effect

Abbreviations: BI … Brief intervention, RCT … Randomised controlled trial, NRCT … Non-randomised controlled trial, MA … Meta-analysis, SMD … Standardised Mean Difference, RR … Relative risk, BA … Brief advice

3.1.2 Lifestyle counselling for a healthy diet

Study characteristics

A 2016 systematic review on **healthy diet** [52] systematically searched seven databases, synthesising 41 RCTs and four pseudo-RCTs involving a total of 23,327 participants. The authors had no conflicts of interest. The review had an unclear RoB due to the reasons given in Table 3-4 above.

1 Systematischer Review (SR): 45 RCTs (23.327 Personen); unklares Bias-Risiko

Table 3-4: Risk of bias of systematic reviews for HD

	Phase 2				Phase 3
Review ID [Reference]	Study eligibility criteria	Identification and selection of studies	Data collection and study appraisal	Synthesis and findings	Risk of bias in the review
ID2 [52]	☺	☺	☺[g]	?[k]	?[f]

Legend: ☺ = *low risk;* ☹ = *high risk;* ? = *unclear risk*

Rationale:

[f] *Concerns of the review not addressed in the interpretation of findings*

[g] *No common risk of bias tool was used, but appropriate criteria were included*

[k] *No information on missing pre-registered meta-analysis and heterogeneity*

Healthy adults aged >18 years were the population of interest, while participants from specific populations (e.g. eating disorders, severe mental illness) or with diagnosed diseases were excluded. The included studies had an average female participation rate of 70%.

Population: Gesunde Erwachsene >18 Jahre; 70 % weiblich

The definition of BI encompassed single sessions conducted in various settings, including universities (14), workplaces (8), online (4), primary care (7), community settings (7), and combinations of these settings (5). The intervention provider was not provided with any further details, and information on the intervention duration was missing. The studies were conducted in various countries, including the UK (13), the USA (11), Europe (18), Australia (2), and Thailand (1).

BI-Definition HD: Einzelsitzungen in verschiedenen Settings + Ländern; Dauer nicht berichtet

The comparators considered were: no intervention or alternative intervention (20); two or more interventions against each other (30); or a combination of both (5).

The outcomes, which were collected over an average follow-up period of 3.5 months, were the intake of fat, fruits, and vegetables, either alone or in combination as well as multiple diet components and/or scores. No information was provided on how the measurements were taken (e.g. self-reports or objective measures). According to the quality criteria checklist of the Academy of Nutrition and Dietetics (ADA) [60], 45 studies were deemed to be at low risk of bias based on a high inter-rater reliability (percentage agreement between assessors) of 82%.

Outcomes: Obst-, Gemüse-, Fettaufnahme nach durchschnittlich 3,5 Monaten FU

Brief interventions and their effectiveness

The identified review (ID2) covered 14 different BI (1 session each). These are listed below (Table 3-5), alongside the number of studies (n) and their percentage share of the total study population. Most research has been conducted on feedback combined with education, education alone, and action/goal planning, whilst the most frequent delivery mode was printed material, accounting for almost 60%.

Effektivität zu 14 verschiedenen BIs (1 Sitzung)

Table 3-5: Brief interventions for a healthy diet

Brief intervention	n	%
Type of intervention		
Education	22	22.4
Feedback	5	5.1
Action or goal planning	16	16.3
Motivational message	14	14.3
Education + feedback	36	26.6
Education + action or goal planning	5	5.1
Education + feedback + action or goal planning	5	3.1
Motivational message + action or goal planning	7	7.1
Mode of intervention delivery		
Print materials	58	59.2
In person with or without print materials	12	12.2
Computer program	8	8.2
Internet	15	15.3
Internet + E-Mail	3	3.1
Video	2	2.0

Studien pro Outcome: u. a.
15 Obst-/Gemüsezufuhr,
10 Obstzufuhr,
7 Fett-/Obst-/Gemüsezufuhr

The results of the systematic review on the effectiveness of BIs have been compiled in Table 3-6. This table contains data from 15 studies on fruit and vegetable intake, 10 studies on fruit intake alone, and five studies on vegetable intake alone, seven additional studies on the results of fat, fruit and vegetable intake, and four studies on multiple nutritional outcomes.

To identify which brief interventions are effective for specific outcomes, the following sections present the effects of each **BI TYPE** on the different **outcomes** (fruit intake, fruit and vegetable intake, fat intake, combined fat/fruit/vegetable intake, and multiple dietary components or diet scores). Results are presented in three sections: (1) effects of BI compared to no intervention; (2) comparative effects between different BI; and (3) differential effects of BI on competing outcomes (HD versus alternative behaviours). Unreported findings indicate unavailable data.

Table 3-6: Summary of findings for BI of healthy diet

No. of reviews (ID)	Quality appraisal	No. of studies	BI vs. Comparator	Effectiveness
Fruit intake (5 studies)				
1 (ID6)	ADA Quality criteria (Inter-rater reliability of 82%): ■ positive quality (12/45) ■ neutral quality (33/45) ■ low risk of bias (45/45)	2	**BI** (writing Action plans (AP) instruction) vs. **no intervention**	**1 study:** at 2w FU fruit servings +2.69 vs. -1.45 pieces/2w, $p < 0.01$ **1 study:** at 1w FU proportion consuming an extra fruit serve/day 9% vs. 4%, $p < 0.05$ total fruit intake (grams/day) was not greater
		1	**BI** (AP with specific instructions + example AP) vs. **BI** (AP with instructions) vs. **BI** (AP no instructions)	1m FU: servings/day +0.1 vs. +0.07 vs. +0.05, $p < 0.05$
		1	**BI** (positively framed health messages) vs. **BI** (negatively framed health messages)	1w FU: fruit intake (cups/day) 1.2 vs. 0.7, p=0.03
			Comparison of 3 IG (feedback on current intakes in a match-mismatch design based on stage of change)	1w FU: no group difference
Fruit and vegetable intake (15 studies)				
1 (ID6)	ADA Quality criteria (Inter-rater reliability of 82%): ■ positive quality (12/45) ■ neutral quality (33/45) ■ low risk of bias (45/45)	**3**	**BI vs. no intervention**	**4 out of 8 BIs were effective**
			writing of action plans	**1 study:** greater increases at 1w FU 1-3 APs: no difference 4 APs: +0.3 servings/day, p=0.03 5 APs: +0.64 servings/day, p=0.04
			tailored education + feedback on current intake	**1 study**: greater increases at 6w +0.45 servings/day for fruit, $p < 0.001$ +0.35 servings/day for vegetables, $p < 0.001$) **1 study:** greater odds of meeting fruit and vegetable recommendations at 3.5 months OR = 2.28, p=0.029
			non-tailored education leaflets	**1study:** no difference at 3.5m
		2	**3 BI** (nutrition education + tailored feedback on current intake, + listening to motivational health message focused on fear and persuasion, or action planning) vs. **alternative intervention** (e.g. stress management intervention)	no difference at 1 week (1) and 2 months FU (1)
		7	**BI** (education and action/goal planning) vs. **BI** (education only)	**5 studies:** greater increases in servings/day (+0.3 to +0.7 servings/day, p values < 0.02), frequency of intake (from once to twice daily, p values < 0.01), number of days meeting recommended serves (+0.5 days/week, $p < 0.01$) of fruit and/or vegetables at 1w or 2y FU **2 studies:** no difference

No. of reviews (ID)	Quality appraisal	No. of studies	BI vs. Comparator	Effectiveness
Fat intake (10 studies)				
1 (ID6)	ADA Quality criteria (Inter-rater reliability of 82%): ■ positive quality (12/45) ■ neutral quality (33/45) ■ low risk of bias (45/45)	6	**BI** vs. **no intervention**	**4 studies:** effective in fat reduction, favouring IG at 1m FU
		4	**BI** (nutrition education, feedback on current fat intake + tailored advice via interactive computer program or website) vs. **no intervention**	**3 studies:** greater reductions in total fat intake at 1-6m FU: 1.2%-8% greater reduction in % energy from fat, and 0.7 greater reduction in fat score, $p < 0.01$ **1 study:** no group difference
		1	**BI** (participants were asked to plan a low-fat diet) vs. **no intervention**	1m FU: 1.25% greater reduction in % energy from total fat in IG, $p < 0.05$ 1.65g/day greater reduction in saturated fat in IG, $p < 0.01$
		1	**BI** (feedback on current fat intake) vs. **BI** recommendation (i.e. with no advice on changing behaviour)	sig. lower at 4- or 18-week FU
		3	**tailored BI** (education, feedback + advice on lowering fat intake, and motivational messages/encouragement to change behaviour) vs. **non-tailored BI** (education + standard advice)	**2 studies:** effective favouring IG 1 study: sig. greater reduction at 6m FU (-9.1% vs. -2.3%, p < 0.001) 1 study: greater reduction in IG of interactive computer program or print materials at 1m FU, but not at 6m FU **1 study:** no group differences after 1 or 6m FU
Fat, fruit and vegetable intake (7 studies)				
1 (ID6)	ADA Quality criteria (Inter-rater reliability of 82%): ■ positive quality (12/45) ■ neutral quality (33/45) ■ low risk of bias (45/45)	**2**	**BI vs. no intervention**	**1 study: at 4m FU**
			education, feedback on current intake + tailored dietary advice	total fat -9g/day, p=0.03 saturated fat -4.3g/day, p=0.04
			standard educational materials	no group difference
			interactive computer module (incl. education + tailored feedback)	**1 study** after 1 to 2m FU: no group difference
		2	**BI** (tailored feedback on current intakes, dietary advice + education) vs. **BI** (non-tailored advice and education)	3 + 8 w FU: 0.9-1.1 greater reductions in fat score, $p < 0.01$ no group difference for fruit and vegetable intakes
		3	**tailored BI** (feedback on current intakes + psychosocial factors (e.g. self-efficacy, social support), dietary advice + education) vs. **non-tailored BI** (education + standard advice)	**1 study:** no sig. group difference at any outcome at 3-4 w FU **1 study:** at 3m FU satured fat scores -1.5, $p < 0.05$ fruit serves/day + 0.24, $p < 0.01$ **1 study: at** 4m FU fruit + vegetable servings/day +0.5, p=0.01, but not sustained at 7m FU

No. of reviews (ID)	Quality appraisal	No. of studies	BI vs. Comparator	Effectiveness
Multiple diet components and/or diet score (4 studies)				
1 (ID6)	ADA Quality criteria (Inter-rater reliability of 82%): ■ positive quality (12/45) ■ neutral quality (33/45) ■ low risk of bias (45/45)	1	**Two BI** (education intervention + education plus goal planning intervention) vs. **no intervention**	1m FU: healthy food servings, or individual food group intakes, are not effective in any group
		2	**BI vs. alternative intervention**	
			education and feedback on current behaviour vs. similar intervention for alternative behaviours (e.g. sun protection)	**1 study:** at 12m FU meeting recommended serves of a range of foods, i.e. fruit and vegetables OR = 1.22, $p < 0.001$ and milk OR =1.15, $p < 0.001$
			feedback on current behaviours + encouragement to change using a social comparison vs. CG (targeting physical fitness)	**1 study**: at 3m FU no group difference on any nutrition outcome (fruit and vegetables, carbohydrates and fats)
		1	**BI** (education + goal planning) vs. **BI** (education only)	1m FU consumption of low-fat dairy (cups/day) +1.0 vs. + 0.53, p=0.03
		1	**BI** (personalised feedback + advice on current intake) vs. **BI** (generic nutrition information)	6m FU: HD score increased 12 m FU: HD score +0.29 vs. -0.04, $p < 0.00001$

Abbreviations: ADA … American Diabetes Association, BI … Brief intervention, AP … Action planning, FU … Follow-up, OR … Odds ratio, p … p-value, HD … Healthy diet, w … week, m … month, IG … Intervention group, CG … Control group

BI vs. no intervention

A total of 13 studies examined the effectiveness of BI compared with no intervention for various outcomes. Ten of these studies found that at least some BI interventions were effective. Five studies did not find any group differences for specific BI.

BI vs. keine Intervention: **Effektivität: 10/13 Studien**

BI that only included EDUCATIONAL MATERIAL showed no difference compared to no intervention with regard to **fruit and vegetable intake** after 3.5 months (1 study) or fat, fruit and vegetable intake after four months of follow-up.

Aufklärungsmaterial allein: begrenzte Wirksamkeit

ACTION PLANNING (writing or instruction for writing) was effective in four out of four studies. Compared to no intervention, **fruit and vegetable intake** increased more after action planning at a one-week follow-up (1 study). However, this only occurred after four or five action plannings (+0.3 and +0.64 servings per day, respectively, p=0.03 and p=0.04), but not after one to three action plannings. According to another study, the proportion of participants consuming an additional serving of fruit per day was significantly higher (9% vs. 4%, $p < 0.05$) after one week of FU, as was the number of fruit servings (+2.69 vs. –1.45 pieces/2weeks, $p < 0.01$) after two weeks of FU. However, there was no difference in total fruit intake (grams/day) between the groups. After one month of FU, there was a 1.25% greater reduction in % energy from total **fat** ($p < 0.05$) and a 1.65 g/day greater reduction in saturated fat ($p < 0.01$) in the group of action planning.

Aktionsplanung: kurzfristiger Effekt auf Obst-/Gemüsezufuhr (OGz) + Fettreduktion

Five of seven studies found that EDUCATION AND FEEDBACK on current dietary intake, with or without tailored advice, were effective. One study showed a greater increase in the IG than in the CG of +0.45 servings per day for **fruit** and +0.35 servings per day for **vegetables** after a six-week follow-up ($p < 0.001$). In one study, education, feedback on current food intake and tailored dietary advice led to a significant reduction in total fat intake (9 g/day, p=0.03) and saturated fat intake (4.3 g/day, p=0.04) at four-month FU. Three studies found that nutritional education, feedback on current **fat intake**, and tailored advice via an interactive computer programme or website were effective on total fat intake after 1–6 months of follow-up. These studies showed a reduction in the proportion of energy from fat of between 1.2% and 8%, and a reduction in fat scores of 0.7 ($p < 0.01$). However, another study showed no group differences in this regard. Similarly, no group differences were found in a study examining the effect of an interactive computer module (including education and tailored feedback) on **fat, fruit and vegetable intake** after one to two months of FU.

Aufklärung mit Feedback/Beratung: signifikante Steigung OGz + Fettreduktion

One study examined the effectiveness of an EDUCATION INTERVENTION and an EDUCATION PLUS GOAL PLANNING intervention. Neither intervention was effective in increasing the number of healthy food servings or individual food group intake, compared to no intervention at the one-month follow-up.

Aufklärung und Aufklärung + Zielplanung ineffektiv

BI vs. BI

A study of the systematic review investigated the effect of different ACTION PLANNING BI on **fruit intake**. After one month, the number of servings per day increased significantly in all action plannings groups ($p < 0.05$). The greatest effect was seen in the action plannings with specific instructions and an example (+0.1), compared to the action plannings with instructions (+0.07) and the action plannings with no instructions (+0.05).

BI vs. BI: **verschiedene Aktionsplanungs-BIs steigern Obstkonsum; Instruktionen + Beispiel am effektivsten**

Feedback + Empfehlung effektiver als Empfehlung/Information allein

verschiedene Feedback-Varianten: keine Unterschiede

Investigations on the impact of **FEEDBACK (+ADVICE)** in comparison to other BI in relation to **fat intake**, **fruit intake** and **diet score** were conducted in a single study each. The results showed a significant reduction in fat intake after four or 18 weeks of follow-up in participants who received feedback on their current fat intake compared to those who received a simple recommendation with no advice on changing behaviour. In a match-mismatch design, feedback on current intakes revealed no group difference in fruit intake after one week of follow-up among three comparison groups. However, the HD score increased six and twelve months after personalised feedback and advice on current intake compared to generic nutrition information (12m: +0.29 vs. -0.04, $p < 0.00001$).

Obstkonsum: positive Botschaften effektiver als negativ formulierte

One study compared the effect of positively and negatively framed **MOTIVATIONAL MESSAGES** on **fruit intake**, observing an increase of 1.2 versus 0.7 cups of fruit per day after one week of follow-up ($p=0.03$).

maßgeschneiderter Aufklärung + Feedback + Empfehlung vs. nicht-maßgeschneiderte Aufklärung + Empfehlung:

höherer Obstkonsum + stärkere Fett-Score-Reduktion

Several studies examined the impact of **EDUCATION AND FEEDBACK (+ ADVICE)** on the intake of fat, fruit and vegetables (5 studies) and fat (6 studies) in comparison to other BIs. Four of these studies showed that tailored BI did not increase **fruit and vegetable intake** when compared to non-tailored advice. This applied to both education with feedback (+advice) (2 studies at 3 and 8 weeks) and tailored BI including feedback + psychosocial factors, counselling and education (2 studies at 3-4 weeks and 7 months). However, fruit servings per day increased by 0.24 ($p < 0.01$) after three months of follow-up after tailored BI (feedback + psychosocial factors, advice and education) compared to non-tailored BI.

A tailored BI consisting of education, feedback and advice on lowering **fat intake**, as well as motivational messages/encouragement to change behaviour, shows mixed results in terms of its effectiveness in reducing fat intake, compared to a non-tailored BI consisting of education and standard advice. According to one study, tailored BI leads to a significantly greater reduction at the six-month follow-up (–9.1% vs. –2.3%, $p < 0.001$), while another study found no group differences after either one or six months. A further study established that the interactive computer programme or print materials group exhibited a greater fat reduction compared to the non-tailored BI (education and standard advice) group at one-month FU, though this was not the case at six-month FU. However, the fat score decreased significantly after education and feedback + advice compared to non-tailored advice and education (two studies: 0.9-1.1, $p < 0.01$) after three and eight weeks FU. Similarly, the saturated fat score reduces significantly after tailored BI of feedback with psychosocial factors (e.g. self-efficacy, social support), dietary advice and education by –1.5, $p < 0.05$, compared to non-tailored BI of education and standard advice after three months FU. However, one study shows no group differences between these tailored and non-tailored BI in fat intake after 3-4 weeks of FU.

Aufklärung + Zielplanung meist effektiver als Aufklärung allein für OGz (5 von 7 Studien)

Eight studies investigated the impact of **EDUCATION AND GOAL PLANNING** compared to education only. One study showed a significantly higher consumption of low-**fat** dairy products (cups per day) of +1.0 vs. +0.53, $p= 0.03$. Five of the seven studies that examined the effect on **fruit and vegetable intake** showed a greater increase in self-reported servings per day one week to two years later, ranging from +0.3 to +0.7 servings per day ($p <0.02$). There was also an increase in the frequency of intake, from once to twice daily ($p < 0.01$). The number of days meeting the recommended intake of fruit and/or vegetables increased by +0.5 days/week ($p < 0.01$) of fruit and/or vegetables. No group differences were identified in two studies.

BI for HD vs. alternative behaviours

HD-BI vs. alternative Interventionen

Overall, four studies examined the effect of BI on behavioural change in comparison to alternative interventions (e.g. stress management, physical activity).

Feedback macht keinen Unterschied bei Obst- oder Gemüsezufuhr

All studies examined **FEEDBACK** on current behaviour with an **additional component**, including nutrition education and listening to motivational health messages, action plannings, as well as encouragement to change. Three studies showed no group difference in **fruit and vegetable** intake after one week and two or three months. Only one study showed that participants who received education and feedback were more likely to meet the recommended intake of a range of foods, e.g. fruit and vegetables (OR = 1.22, $p < 0.001$) and milk (OR = 1.15, $p < 0.001$), compared to a similar intervention for alternative behaviours (e.g. sun protection) at 12-month follow-up.

3.1.3 Lifestyle counselling for alcohol consumption

Study characteristics

4 SR (ID3-ID6): 138 RCTs; niedriges bis hohes Risiko für Verzerrungen

Four systematic reviews (ID3-ID6) were included, aiming to evaluate the effectiveness of BI for **alcohol consumption** [53-57]. One Cochrane review (ID4) and one umbrella review (ID3) performed a meta-analysis, while one systematic review synthesised its results using meta-regression (ID5) and another used narrative synthesis (ID6). Only the Cochrane review reported some conflicts of interest. The literature searches covered the period from 2014 to 2017 and included three to 15 databases. Three of the four reviews included over 15,000 participants, while one review (ID6) had a sample size ranging from 29 to 497. Of four reviews, one (ID4) had a low risk of bias (RoB), while another had an unclear RoB (ID5). Two systematic reviews had a high RoB due to missing pre-registered protocols (ID3, ID6), see Table 3-7. Overall, synthesis and findings were primarily responsible for concerns regarding bias in the systematic reviews (see Figure 3-1).

Table 3-7: Risk of bias of SRs for AC

	Phase 2				Phase 3
Review ID [Reference]	Study eligibility criteria	Identification and selection of studies	Data collection and study appraisal	Synthesis and findings	Risk of bias in the review
ID1 [51]	☺	☺	☺	☹[d]	☹[f]
ID4 [54, 55]	☺	☺	☺	☺	☺
ID5 [56]	☺	☺	?[g,h]	?[i]	?[f]
ID6 [57]	☺	☺	☺	☹[d]	☹[f]

Legend: ☺ *= low risk;* ☹ *= high risk;* ? *= unclear risk*

Rationale:

[d] *Protocol not available*

[f] *Concerns of the review not addressed in the interpretation of findings*

[g] *No common risk of bias tool was used, but appropriate criteria were included*

[h] *Missing information at the no. of risk of bias assessors*

[i] *Missing pre-registered subgroup analysis*

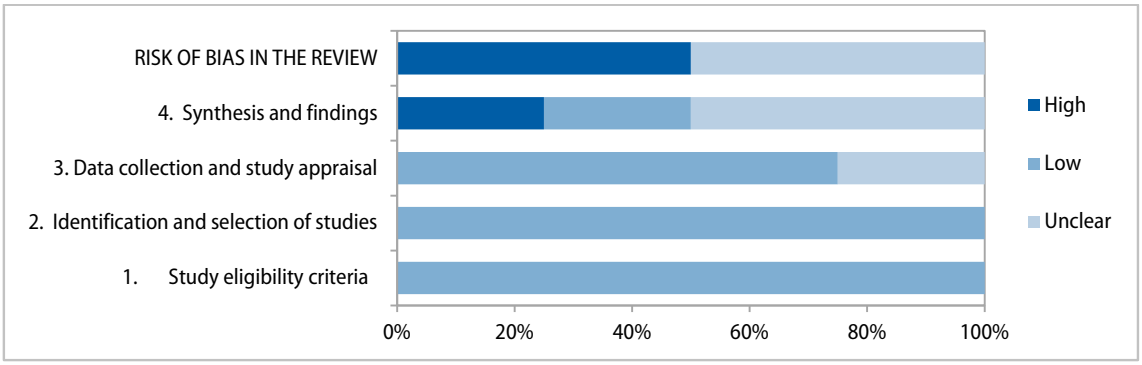

Figure 3-1: Summary of risk of bias assessment of included studies for alcohol consumption

The systematic reviews included 138 RCTs (ID4–ID6) and seven systematic reviews, each comprising seven to 22 RCTs (ID3). Due to existing overlaps, the total number of RCTs was 115 (see the *Supplemental material* Dataextraction – *Sheet* 'Duplicate studies'). Senft et al. [61] and Richmond et al. [62] appeared in seven out of ten systematic reviews in total. Five other RCTs appeared six times, and four appeared five times. Of the 115 RCTs in total, 59 appeared once and 18 appeared twice.

Population: Gesamtbev. mit riskantem AC; 1 Review für Personen mit mentalen Problemen

The population of interest in all systematic reviews comprised the general population, with three systematic reviews (ID3, ID4 and ID6) focusing on individuals who tested positive for risky alcohol consumption. One systematic review (ID5) excluded individuals with complex health issues who sought help at specialist addiction centres, mental health facilities, or antenatal clinics. By contrast, another systematic review (ID6) explicitly included individuals with mental health problems. The vast majority of studies included in the systematic reviews considered men and women.

1-5 Sitzungen, <5 Min – 2h; v. a. in Primärversorgung + Hocheinkommens-/ westliche Länder

Defined BI varied in intensity, ranging from one to two sessions [53] to one to five sessions [54, 55], with durations spanning [53] from less than 5 minutes to 60 minutes [54, 55], and up to two hours of counselling [54]. The studies were conducted in various primary care settings, though these were defined heterogeneously. Settings included general practices, ambulatory care, emergency departments, university-based facilities, and hospital settings. Notably, the majority of studies were conducted in high-income Western countries. BI providers were predominantly doctors (6 out of 7 studies) [53] or general practitioners, whilst other studies involved nurses, counsellors, or mixed provider types [56]; in two reviews, information on provider type was not available.

verschiedene Komparatoren

Studies included comparisons of BI to no or minimal intervention (ID4, ID6) or comparisons of interventions with each other (ID5, ID6). One study did not specify a comparator (ID3).

Outcomes: Menge, Häufigkeit, Prävalenz exzessiven Trinkens; Follow-up 6-48 Monate

All systematic reviews determined the quantity of alcohol consumed, while three out of four also determined the frequency. Two systematic reviews also determined the prevalence of excessive drinkers. One systematic review [54, 55] also assessed other outcomes, such as heavy episodic drinkers, quality of life, and economic evaluations. Only one review [57] disclosed its outcome measures as self-reported outcomes; all other reviews did not provide information on how outcomes were measured. The follow-up period varied from six to 48 months. Study quality was assessed using various tools, including AMSTAR, GRADE and the Risk of Bias Tool.

Brief interventions and their effectiveness

BI-Typen: unterschiedliche Inhalte, Länge, Follow-ups, Zusatzelemente

meist motivierende Gesprächsführung (MI)/ verwandte Ansätze

The four systematic reviews (ID3-ID6) show varying types of BI for AC, which differ in terms of their basic content, length, follow-up sessions and additions. In terms of content, BI is based almost exclusively on motivational interviewing (MI) or related therapies or tools, such as the FRAME ("Feedback, personal Responsibility, Advice, a Menu of options, Empathic style of interaction, and support for Self-efficacy" [63]) advice approach or Motivational Enhancement Therapy (103 RCTs). The BI from two studies is based on cognitive behavioural therapy; however, the content of all other brief interventions or advice is not described in detail.

Sitzungslänge variiert (3-90 Min); multiple Sitzung (3 Reviews); Zusatzelemente vorhanden

According to one umbrella review (ID3), the length of the sessions varies between three and 90 minutes, while another (ID5) included BI with a duration less than two hours. Three reviews consider multiple sessions, which may involve face-to-face contact or a follow-up telephone call. Another review mentions additional elements, such as diaries or exercises for participants to complete at home (ID4).

The results regarding the effectiveness of the BIs are presented in Table 3-8.

Table 3-8: Summary of findings of BI for alcohol consumption

No. of reviews (ID)	Quality appraisal	No. of pts. (no. of studies/SR)	BI vs. Comparator	Effect [95%-CI], I^2 (in %)
Quantity in the general population				
1 (ID4)	GRADE: Moderate	15197 (34)	**BI** (1-5 sessions in total < 60 min.) vs. **no or minimal intervention**	Mean difference (MD): g/week: –20.08 [28.36; –11.81], 73
1 (ID5)	RoB: 71% of studies low RoB	■ Brief advice (BA): 26 (12) ■ Motivational interviewing (MI): 132 (24) ■ MI plus: 110 (20)	BA vs. MI vs. MI plus (enhanced protocols or additions to MI)	Difference: Overall time-adjusted: –0.15 [–0.20; –0.11], 36 BA: –0.20, [–0.30;–0.09], 39 MI: –0.13 [–0.19;–0.07], N.A. MI plus: –0.16 [–0.23;–0.09], N.A.
1 (ID3)	AMSTAR Score: ranging from 7-10	■ 5697, including 1 study n.a. (3 SRs)	**BI** (10–15 min, 3–5min FU sessions) vs. CG of **minimum intervention** (MinI: 3-5 min of initial intervention, without FU sessions) vs. **extended intervention** (EI: 10-15 min of initial intervention with FU sessions of 10-15 min each) vs. **usual care** (UC)	Effectiveness: BI > all CG
			BI (5-20 min) + **FU** vs. **BI no FU**	Effectiveness: BI + FU > BI no FU
			BI (15 min) + **FU** vs. CG of **BI** (15 min) **no FU** and **very BI** (5 min)	Effectiveness: BI + FU > all CG
Frequency in the general population				
1 (ID4)	N.A.	15197 (34)	**BI** (1-5 sessions in total < 60 min.) vs. **no** or **minimal intervention**	MD: days/week: –0.13 [–0.23;–0.04], 0 heavy drinking episode –0.08 [–0.14;–0.02], 22
1 (ID5)	RoB: 71% of studies low RoB	■ BA: 26 (12) ■ MI: 132 (24) ■ MI plus: 110 (20)	**BA** vs. **MI** vs. **MI plus** (enhanced protocols or additions to MI)	Overall, time-adjusted: –0.16 [–0.20; –0.11], 23 BA: –0.08 [–0.26;0.09], 29 MI: –0.15 [–0.21;–0.08], N.A. MI plus: –0.19 [–0.27;–0.11], N.A.
Quantity and frequency in pts. with common mental health problems				
1 (ID6)	RoB: low (3 studies) to high (2 studies)	N.A., (9)	**BI** vs. **minimally active comparator**	Difference: 5 studies: no difference 4 studies: difference, in drinks/week or hazardous drinking
	RoB: 2 studies unclear	N.A., (2)	**BI** vs. **active comparator**	no group difference

No. of reviews (ID)	Quality appraisal	No. of pts. (no. of studies/SR)	BI vs. Comparator	Effect [95%-CI], I^2 (in %)
Heavy drinkers				
1 (ID3)	AMSTAR Score: 7-10	5697, including 1 study n.a. (3 SRs)	**BI + FU** vs. CG of **MinI** and **EI** and **UC**	Effectiveness: BI + FU > all CG
			VBI or 1 session vs. **multi-contact interventions** (15 min + FU)	Effectiveness: VBI or 1 session < MCI
1 (ID4)	N.A.	15197 (34)	**BI** (1-5 sessions in total < 60 min.) vs. **no or minimal intervention**	Risk difference: Heavy drinkers: –0.09 [–0.13; –0.04], 77 Heavy episodic drinkers: –0.07 [-0.12; –0.02], 76
GGT (IU/L)				
1 (ID4)	N.A.	1166 (3)	**BI** (1-5 sessions in total < 60 min.) vs. **no or minimal intervention**	MD: –0.89 [–3.86; 2.08], 0
Adverse effects				
1 (ID4)	N.A.	N.A. (5)	**BI** (1-5 sessions in total < 60 min.) vs. **no or minimal intervention**	Difference: 1 study: Difference in binge drinking in women favouring IG (ARR –30%, [95%-CI -47; –9]) 4 studies: no group difference
Patient satisfaction				
1 (ID4)	N.A.	N.A. (2)	**BI** (1-5 sessions in total < 60 min.) vs. **no or minimal intervention**	Difference: 1 study: no difference 1 study: difference favouring IG
Quality of life				
1 (ID4)	N.A.	N.A. (5)	**BI** (1-5 sessions in total < 60 min.) vs. **no or minimal intervention**	Difference: 4 studies: no difference 1 study (SF-36): marginal improvement in IG 1 study (GHQ-12) significant greater improvement in IG
Cost-effectiveness				
1 (ID4)	N.A.	N.A. (6)	BI (1-5 sessions in total < 60 min.) vs. **no or minimal intervention**	BI likely to be cost-effective

Abbreviations: pts. … patients, SR … Systematic review, CI … Confidence interval, I^2 … I-squared, RoB … Risk of bias, BI … Brief intervention, MD … Mean difference, N.A. … Not applicable, BA … Brief advice, MI … Motivational interviewing, FU … Follow-up, IG … Intervention group, CG … Control group, MinI … Minimal intervention, EI … Extended intervention, UC … Usual care, GGT (IU/L) … Gamma-Glutamyl transferase, SF-36 … 36-Item Short Form Health Survey, GHQ-12 … General Health Questionnaire-12

BI vs. no or minimal intervention or usual care

BI vs. Minimal-Intervention/Standardversorgung:
BI reduziert AC-Menge nach 12 Monaten (MD –20,08); kleiner Effekt auf Häufigkeit

Three out of four systematic reviews (ID3-ID4, ID6) compare the effectiveness of BI with no or minimal intervention or usual care in terms of different outcomes. In terms of **quantity**, a Cochrane review (ID4) shows that, 12 months after BI (one to five verbally delivered information, advice, or counselling sessions), participants (n=6,946, 15 RCTs) consumed 20 g less alcohol per week than those who received no or minimal intervention (pooled mean difference (MD) –20.08 g/week, 95% confidence interval (CI) –28.36; –11.81, I^2=73%). In terms of **frequency**, the review indicates that BI had a small impact on heavy episodic drinking compared to CG (−0.08 episodes/week [95%-CI: −0.14;−0.02], I^2=22%). However, participants from 11 trials (n= 5,469) reduced their drinking frequency to 0.13 days/week ([95%-CI: −0.23; −0.04], I^2=0%) compared to the CG. Results from 10 trials (3,128 participants) suggest no meaningful change in intensity (grams per occasion) due to BI (–0.18 [95%-CI: –3.09;2.73], I^2=25%).

Another review investigating **quantity** and **frequency** in the population of persons with common **mental health** problems (ID6) revealed a significant group difference between BI (1-4 sessions) and minimally active comparator in four studies, but no significant difference in five studies.

inkonsistente Ergebnisse für Personen mit mentalen Problemen

Two reviews examined the effectiveness of BI on **heavy drinkers**, including a systematic review (ID3), which determined the prevalence among 7,334 participants across seven studies (one of which did not specify the number of participants). The results showed that a BI (mostly 1-2 sessions) with one FU session was more effective in reducing the prevalence of excessive alcohol consumption than a minimal intervention (MinI) of three to five minutes without follow-up or usual care (two studies). Furthermore, a meta-analysis (ID4) showed a 9% reduction in heavy drinkers (18 studies, 7,623 participants) and a 7% reduction in heavy episodic drinkers (10 studies, 4,456 participants) 12 months after BI (1-5 verbally-delivered information, advice or counselling) compared to no or minimal intervention (–0.09 [95%-CI: −13; −4], I2=77% and –0.07 [95%-CI: −12;−2], I2=76%).

9 % Reduktion starker Trinker; 7 % Reduktion episodischen Trinkens; BI mit Follow-up effektiver als ohne Follow-up

The same review (ID4) reported results on **additional outcomes**. After 12 months, there were no significant differences between BI and minimal or no intervention (CG) in serum gamma-glutamyl transferase (GGT) **biomarkers** (3 studies, 1,166 participants). One of five studies found group differences in **adverse effects**, with an increase in binge drinking in women after the BI (absolute risk reduction –30%, [95%-CI: –47; –9]). In one of two studies, greater satisfaction was observed in the BI group compared to the CG group. **Health-related quality of life** did not differ significantly in four of the six studies. One study observed a marginally significant improvement in the BI group using the SF-36 survey instrument, while another study found a significantly greater improvement in the BI group using the GHQ-12 survey instrument. Regarding **cost-effectiveness**, most of the six relevant studies suggested that BI was likely to be a cost-effective approach.

Keine Unterschiede bei Biomarkern (3 Studien) + Nebenwirkungen (1/5 Studien); gemischte Ergebnisse bei Lebensqualität

BI wahrscheinlich kosteneffektiv

BI vs. BI

Three out of four systematic reviews (ID3, ID5, ID6) compared the effectiveness of different BIs for various outcomes, while two considered the outcome **quantity**. Of these, one review (ID5) compared **BRIEF ADVICE** (BA), **MOTIVATIONAL INTERVIEWING** (MI), including motivational interviewing-style, advice approaches (e.g. FRAMES, brief MI), and **MI PLUS,** which had an enhanced protocol or additions to MI. The review revealed an overall effect of BI (BA, MI, MI plus) with a small but statistically significant time-adjusted reduction in weekly AC of −0.15 ([95% CI −0.20; −0.11], I^2=36%), based on data from 50 studies (n=268). Significant mean effects were observed in all content groups, with BA (n=26, 12 studies) appearing to be more effective (difference d=−0.20, [95% CI −0.30;−0.09]) than MI (132 participants, 24 studies) with an effect (d) of −0.13 [95% CI −0.19; −0.07] and MI plus (110 participants, 20 studies) (d=−0.16, [95% CI −0.23 to −0.09]). Furthermore, results of an umbrella review (ID3) show that BI with FU sessions are more effective than those without FU, when quantity is taken into account. Accordingly, 5-20 minutes of BI with a FU session of the same duration (2 SRs) and 10-15 minutes of BI with 3-5 minutes of FU sessions (1 SR) are more effective than the same BI without a FU session.

BI vs. BI:
Kurzer Hinweise (BA), MI + MI-Plus signifikante wöchentliche AC-Mengen Reduktion; BA am effektivsten

BI mit Follow-up-Sitzung effektiver als ohne Follow-up

In terms of frequency, the overall time-adjusted effects (all frequency outcomes, settings, providers, and content) of **BA**, **MI** and **MI PLUS** (ID5) showed a significant reduction in the **frequency** of any drinking occasion and binge drinking (–0.16 [95%-CI −0.20; −0.11], I^2=23%). Subgroup analysis showed that MI plus had the highest statistically significant effect, with a reduction in frequency of –0.19 [95%-CI: −0.27;−0.11), while MI alone showed a reduction of –0.15 [95%-CI: −0.21;−0.08). No significant effect was observed with brief advice (–0.08 [95%-CI: −0.26;0.09; I^2=29%]).

BA, MI + MI-Plus signifikante Reduktion der Trinkfrequenz; MI-Plus am effektivsten;. BA nicht signifikant

BI (1-4 sessions) in a **population with common mental health problems** (ID6) showed no significant differences compared to the active comparator group in terms of **quantity and frequency**.

bei mentalen Problemen: keine Unterschiede in Trinkmenge + -häufigkeit

One review (ID3) investigating the prevalence of **excessive alcohol consumption** showed that BI with one FU session was more effective than an extended intervention of 10-15 minutes BI with 10-15 minute FU sessions. The results also showed that multi-contact interventions (MCIs) of 15 minutes were more effective than very brief interventions or single sessions (1 study).

multiple Kontakte effektiver als Einzel-sitzungen für excessiven AC

3.2 Empirical results on implementation aspects

3.2.1 Characteristics of study participants

Table 3-9 shows the characteristics (covered by questions Q101–Q104) of a total of 14 participants (ID001-ID014=100%). The most frequent participants were from Burgenland, Lower Austria and Salzburg. Approximately 86% of physicians operate in individual or group practices as compared to primary care centres.

14 Ärzt:innen aus 6 Bundesländern; 86 % Einzel-/ Gruppenpraxen

Four participants dropped out of the qualitative question section (Q201-Q401). Accordingly, the qualitative results presented below are based on 11 participants (Q201, regarding the Status Quo) and 10 participants for Q202-Q401, which addressed RQ3.

4 Drop-outs (28.6 %) bei qualitativen Fragen

Table 3-9: Characteristics of participants

Participants	No.	%
Total	14	100.00%
State		
Burgenland	3	21.43%
Carinthia	1	7.14%
Lower Austria	3	21.43%
Upper Austria	2	14.29%
Salzburg	3	21.43%
Styria	0	0.00%
Tyrol	0	0.00%
Vorarlberg	0	0.00%
Vienna	2	14.29%

Participants	No.	%
Setting		
PMCU centre	2	14.29%
Individual or group practice	12	85.71%
Contract type (PMCU)	14	100.00%
PMCU in the last 6 months		
PA	14	100.00%
HD	14	100.00%
AC	14	100.00%
Drop-out		
Q201	3	21.43%
Q202-Q401	4	28,57%

Abbreviation: PMCU … Preventive medical check-up

5 Hauptkategorien, 12 Subkategorien

Table 3-10 illustrates the category system, including codes and subcodes. *Supplemental material* – Coding and Coding_Document provide an overview of all coded elements and their frequency distribution. The results of the quantitative analysis of code frequencies, both overall and by subgroup, are presented in the *Supplemental material* – Code_Frequency, **Fehler! Hyperlink-Referenz ungültig.**. The qualitative case comparisons by coded segments can be found in the *Supplemental material* – Case_Comparison.

Table 3-10: Category system

Main category	Subcategories	Definition
1. Status quo		Describes how physicians currently provide LsC in practice.
	Referral	Describes current LsC in the form of referrals to other professional groups.
	Counselling	Describes the current LsC in the form of counselling.
	Explanation of laboratory results	Describes current LsC in the form of an explanation of laboratory results.
	Discussion of problematic values and behaviour	Describes current LsC in the form of a discussion of problematic values and behaviour.
2. Cooperation		Describes all aspects of current cooperation/exchange with other professional groups.
3. Challenges		Describes challenges of LsC in everyday practice.
	Time	Describes time as a challenge for LsC.
	Target group	Describes the target group or patients as a challenge for LsC (e.g., who uses the PMCU, language barriers, attitudes, etc.).
4. Requirements		Describes the current specific requirement for the practical implementation of LsC.
	Collaboration	Describes necessary systemic improvements for implementing LsC.
	Incentives	Describes necessary financial incentives for implementing LsC.
	Time	Describes time as a necessity for the implementation of LsC.
	Material/Content	Describes the necessary materials or knowledge for performing LsC.
	HD specific	Describes specific requirements for providing tailored diet counselling.
	PA specific	Describes all aspects of cooperation/exchange with other professional groups.
5. Suggestion for improvement		Describes ideas for improving PMCU in the future.

Abbreviations: LsC … Lifestyle Counselling; HD … Healthy diet; PA … Physical activity; PMCU … Preventive medical check-up

3.2.2 Current Lifestyle Counselling and Cooperations

Ärzt:innen erklären Laborbefunde; diskutieren problematische Werte/Verhaltensweisen

The surveyed physicians stated that they **explain laboratory findings** in detail and use these findings, alongside medical history (e.g. BMI and digestion), to discuss problematic behaviours such as AC, obesity, and the consumption of unhealthy fats (ID_002, ID_008). Respondents also **discuss** bad habits and the importance of a healthy lifestyle with their patients on an individual basis (ID005, ID006). One respondent emphasised the importance of motivating patients:

> „sehr individuell – motiviere ich, sich der anamnestisch oder durch Befunde erhobenen Schwachpunkte bewusst zu werden. (ID011)"
>
> *"very individually – I motivate them to become aware of their weaknesses as revealed by their medical history or findings. (translated by JAP)"*

Inhalte: Individuelle Empfehlungen zu Bewegung, Ernährung, Alkohol

Respondents state that they provide counselling on exercise, diet and AC. Physicians recommend PA and exercise, including endurance and strength training, as well as considering posture, the pelvic floor and the spine (ID007, ID009, ID011, ID014). Recommendations are also made regarding low-sugar and low-calorie diets, reducing processed and heated fats, consuming healthy fats, and ensuring an adequate protein intake (ID004, ID009, ID011). Information about the harmless and risk limits for alcohol is provided by one person (ID012).

Formen: Tipps, Erklärungen, Informationshilfe, personalisierte Empfehlungen

The **types of counselling** offered take the form of tips (ID005), explanations (ID002, ID004), support in obtaining information (ID005), and personalised recommendations (e.g. for athletes regarding protein powder and creatine, as mentioned by ID011).

> „Ich gebe praktische Tipps für die Implementierung der regelmäßigen Bewegung in die Alltagsroutine, Ernährungstipps und helfe weitere Informationen zu finden. (ID005)"
>
> *"I provide practical tips for incorporating regular exercise into daily routines and offer nutritional advice. I'll also help to find further information. (trans. by JAP)"*
>
> „Erklärung wie man abnimmt (Stichwort: Kaloriendefizit). Grobe Umschreibung von mind. Proteinzufuhr und Reduktion von Zucker und insbesondere Junkfood. Tabelle bzw. Internetrechner für Grundumsatz ausrechnen. (ID004)"
>
> *"Explanation of how to lose weight (keyword: calorie deficit). Brief description of the minimum protein intake and reduction of sugar, particularly from junk food. Online calculator or table for calculating basal metabolic rate. (trans. by JAP)"*

1 Person: spezifische Tools (Folder, ÖGK-Broschüren)

Only one person (ID014) mentions specific **tools**, such as the alcohol questionnaire, as well as aids such as folders, ÖGK brochures and display boards, that are used for counselling.

gelegentliche Zuweisungen zu Ernährungsberatung, Physiotherapie, Psychotherapie

Patients are occasionally referred for nutritional counselling or physiotherapy (ID_002, ID_006 and ID_009). Collaborations also exist with services such as dietary counselling, alcohol rehabilitation or psychotherapy/psychology (ID_003, ID_005, ID_007-ID_009, ID_012, ID_014). Specifically, nutritional counselling in the ÖGK health information centre (by telephone) is mentioned (ID_012). However, one interviewed person claims that direct cooperation with other proffessions is not possible and only recommendations for physiotherapy, medical spa treatments, or dietetic counselling are feasible (ID005).

3.2.3 Challenges

Figure 3-2 shows that all ten participants addressed challenges. Eight out of these ten respondents identified the target population as a challenge, while 50 per cent (5 out of 10) highlighted limited time as an issue.

Größte Herausforderung:
80 % nennen Zielgruppe

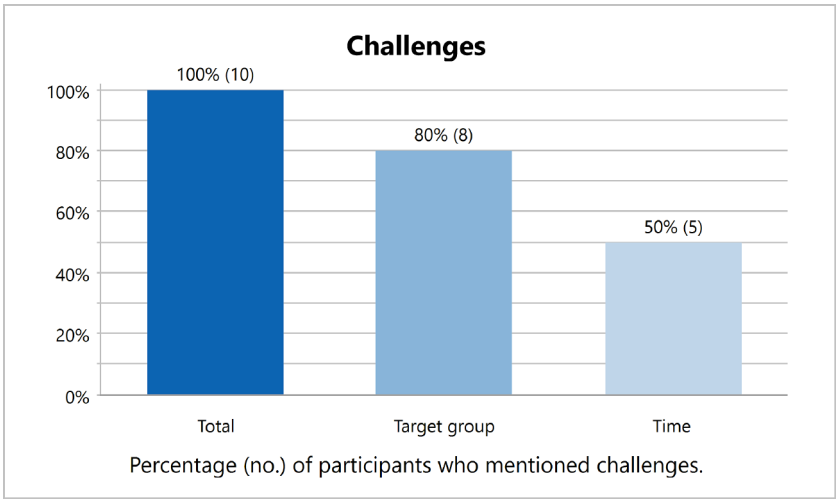

Figure 3-2: Challenges mentioned by participants in percent (no.) in total and their subgroups of target group and time

The target population is reported as problematic in two respects. Firstly, at the patient level and secondly, at a structural level. At the patient level, the "lack of health literacy among the population" (ID012, trans. JAP) is particularly highlighted. There is a lack of "general understanding of people regarding their health" (ID002, trans. JAP), which is associated with high time investment (ID002).

mangelnde Gesundheitskompetenz + Änderungsbereitschaft der Patient:innen

> „wenn ich bei null anfangen muss, sitze ich bei einem Patienten 2 Stunden (ID002)"
> *"if I have to start from scratch, I sit with one patient for two hours (trans. JAP)"*

Furthermore, patient attitudes (ID005, ID006) and "resistance to counselling among certain patient groups" (ID009, trans. JAP), as well as dietary modifications in general (ID007), are perceived as challenging. Language barriers with patients for whom German is a foreign language are also mentioned (ID002). At a structural level, it is additionally noted that "mainly patients who already pay attention to healthy lifestyles come for preventive care anyway. Those who would need it do not come" (ID003, trans. JAP).

Sprachbarierren

Erreichbarkeit der Risikopersonen

Time is generally perceived as a challenge (ID002, ID009, ID011, ID012, ID014). Dietaric counselling in particular appears to exceed the temporal framework of preventive examinations (ID002, ID009).

50 % nennen Zeit als Herausforderung

> „Bei 15 min Zeit für Anamnese, körperliche Untersuchung und Beratung kommt meist die Beratung zu kurz. (ID014)"
> *"With 15 minutes allocated for medical history, physical examination and consultation, there is usually not enough time for counselling. (trans. JAP)"*

3.2.4 Requierements

All respondents who completed the questionnaire (n=10) mentioned requirements for implementing LsC (see Figure 3-3). Subgroup analysis showed, that most of them named time and materials or content as necessary. Additionally, the need for further incentives and cooperation was emphasised. Overall, time was mentioned ten times (46% of total requirements subgroup codes), while materials/content and incentives (especially financial ones) were mentioned five times each (23%) and collaboration only two times (9%).

wichtigste Voraussetzung = Zeit (alle Befragten; 46 % der Nennungen)

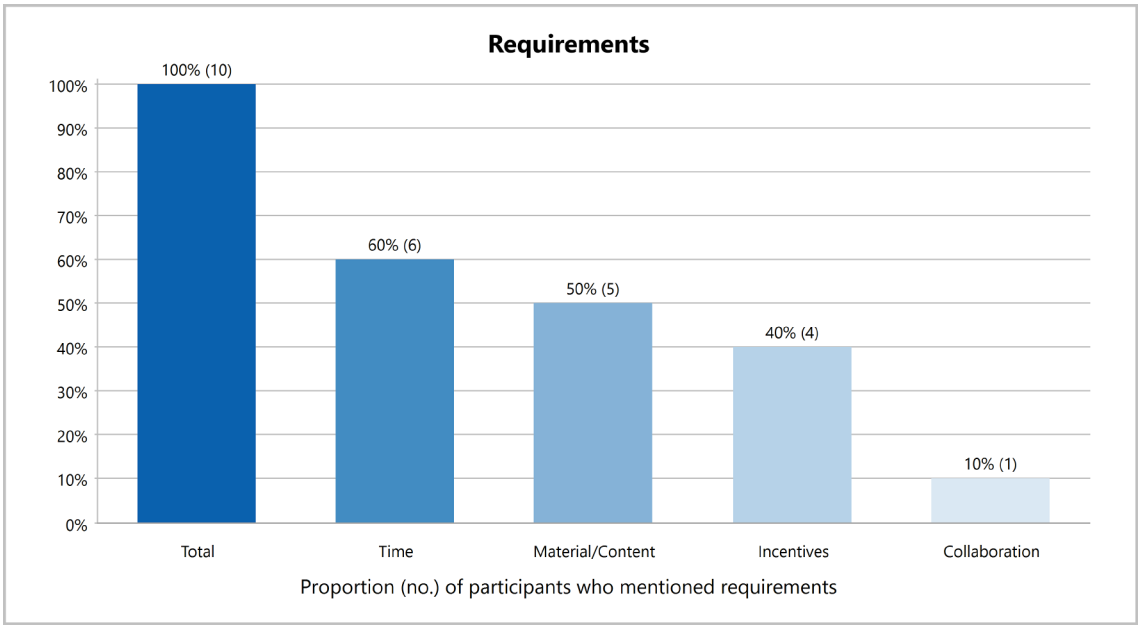

Figure 3-3: Requirements mentioned by participants in percent (no.) in total and their subgroups of time, material/content, incentives, and collaboration

Respondents cite **time limitations** as a key factor preventing them from offering lifestyle advice. For instance, it was mentioned that genuine preventive care and lifestyle advice require time and can only be offered to a limited extent in general practice (ID002). More time is also required to address patients' personal needs and psychological stress (ID008).

Materials represent another aspect that the surveyed physicians indicated as essential, including leaflets, visual aids, websites and online brochures or information sheets (for example, on sugar-free, low-cholesterol diets and physical exercise) (ID002; ID003; ID007; ID009). Information materials should be concise, brief and available in multiple languages (ID002). Regarding **content**, target agreements on regular exercise, such as those implemented in the 'Therapie Aktiv' programme, would assist one respondent (ID005) in improving their preventive examinations.

***Bedarf:* mehrsprachige Infomaterialien (Folder, Websites, Broschüren);**

inhaltlich Zielvereinbarungen

„Zeit fehlt und sehr einfach gestalltete Basisinformation (folder) in mehreren Sprachen (ID002)"

"time is missing and very simply designed basic information (folder) in several languages (trans. JAP)"

According to the respondents, health insurance should create **incentives** to motivate patients, for example, by reducing co-payments or introducing a bonus-malus system similar to the one used by the Social Insurance for the Self-Employed (SVS) (ID003, ID005, ID012). Doctors should also be paid accordingly for additional services (ID009).

Bonus-Malus-System für Patient:innen; adäquate Honorierung für Ärzt:innen

> „Auch geringgradige finanzielle Anreize z. B. Senkung des Selbstbehalts als Belohnung von der Motivation, wie z. B. ein Trainingsnachweis oder Verbesserung der BMI/Fettanteil des Körpers. (ID005)"
>
> *"Even minor financial incentives, e.g. reducing the co-payment as a reward for motivation, such as a training proof or improvement in BMI/body fat ratio. (trans. JAP)"*

Finally, one respondent (ID011) suggests that for the general implementation of LsC, increased opportunities for referrals, such as to dietitians, psychotherapists, social counsellors, and support services for families with older children, would be beneficial.

mehr Zuweisungsmöglichkeiten zu Diätologie, Psychotherapie, Sozialberatung

Evidence-based physical activity intervention

The evidence gathered in the systematic review showed that follow-up sessions have a positive effect on PA counselling (see chapter 3.1.1). To conduct follow-up sessions, respondents would require additional time (ID005, ID006, ID009, ID011, and ID014), appropriate remuneration for the supplemental work, and billing options that accommodate health insurance (ID003, ID007, and ID009). In addition, organisational aspects (ID014) and more detailed information is needed about what should be asked during both the initial examination and the follow-up examination (ID002). Information posters (ID006) and group physiotherapy (ID008) were also suggested to facilitate the follow-up intervention.

zusätzliches Follow-up (PA-Intervention) erfordert Zeit, Honorierung, Organisationsaspekte, Infomationen

Evidence-based healthy diet intervention

The systematic review identified evidence showing that tailored interventions combining positive/motivational messages with action/goal planning have a positive effect on healthy diet. However, respondents stated that such an intervention would be too demanding for general practice and exceed the timeframe (ID002, ID009). Such interventions would require collaboration with dietitians or nutritionists (ID002, ID005, ID014), additional time allocation (ID002, ID006, ID009), physician training on counselling intervention (ID011), illustrative materials and nutrition plans (ID003, ID006), and appropriate remuneration (ID012). One respondent suggested that patients could be offered nutritional counselling annually as part of their PMCU (ID009).

effektive HD-Intervention überfordert Praxen; erfordert Kooperation mit Diätologie:innen, Zeit, Training etc.

> „aufgrund der wirklich begrenzten zeitlichen Ressourcen, Auslagerung dieses Themenfeldes an unsere Diätberatung evtl. Implementierung der Möglichkeit für Patienten 1x/Jahr im Rahmen einer VU auch eine Ernährungsberatung in Anspruch zu nehmen-da dieses Thema in der hausärztlichen Praxis den zeitl. Rahmen sprengt"
>
> *"due to the very limited time resources, outsourcing this topic to our dietary counselling service. Possibly implementing the option for patients to take advantage of nutritional counselling once a year as part of a PMCu, since this topic exceeds the time frame available in general practice. (trans. JAP)"*

3.2.5 Suggestions for improvement

Entwicklungspotential:

In addition to the requirements for implementing PMCU, the respondents suggested some simple improvements to the process.

Anreizsysteme, strukturierte Einladungen

To **enhance utilisation** of these services, they suggested that health insurance companies should establish additional incentives (ID003) and send regular, structured invitations to PMCU (ID005).

weniger Klicks im VU-Formular; Gruppenberatungen

To **reduce the time** required, it was suggested that the number of clicks on the PMCU form be reduced (ID008) and opportunities created for group consultations (ID012).

Trennung Screening/Prävention; Aktualisierung Blutparameter; Hydrations-Hinweise

In terms of **content**, respondents suggested separating screening and prevention (lifestyle factors) (ID002) and updating blood parameters (e.g. LDL) (ID014). They also recommended that hotlines inform patients of the importance of adequate hydration prior to initial consultations involving blood sampling. This would increase patients' absorption capacity and concentration during the consultation (ID011). A further request was made for a poster depicting the seven pillars of healthy ageing to be displayed in medical facilities, with the suggestion that it be circulated to all contracted doctors (ID006).

Kooperation ausbauen

In terms of **collaboration**, measures to combat loneliness (e.g., meditation, coffee parties) (ID008) and cooperation with sports clubs, nutrition groups, and psychological support groups (ID014) were identified.

4 Discussion

Lifestyle-related diseases have severe health impacts and have been investigated for decades. Studies show that noncommunicable diseases account for 82% of deaths in Austria, with cardiovascular disease, cancer, diabetes, and chronic respiratory diseases being the leading causes. These are primarily driven by four behavioural risk factors: unhealthy diet, physical inactivity, alcohol consumption, and tobacco use. Despite the availability of Austria's preventive medical check-up (PMCU) programme since 1974, which provides free annual screening and lifestyle counselling to all adults aged 18 and above, population health indicators have worsened in recent years. Dietary and physical activity patterns have deteriorated, whilst tobacco use among women exceeds the EU average, and every second person demonstrates limited health literacy. The preventive medical check-up addresses lifestyle risks through screening measures (including body-mass-index, blood pressure, blood glucose, cholesterol, smoking, and alcohol questionnaires) and counselling using the 5As model during follow-up consultations. However, the programme was last updated in 2005, and questions remain about whether lifestyle counselling is effective and practically feasible within the Austrian PMCU and whether it can generate measurable population health benefits. Successful lifestyle counselling requires a trusting patient-practitioner relationship, continuity of care, and long-term follow-up, which may not align with the current one-off consultation approach. Against this background, the aim of this report was to systematically identify evidence-based brief interventions for physical activity, healthy diet, and alcohol consumption; to analyse their effectiveness; and to explore the feasibility of their implementation within the Austrian PMCU programme.

Gesundheitsauswirkungen von Lebensstil-Erkrankungen; Haupttreiber: ungesunde Ernährung, Bewegungsmangel, Alkohol-/Tabakkonsum

Trotz VU (inkl. Lebensstileratung) verschlechterter Lebensstil in Ö

letztes VU-Update: 2005

Beratungs-Effektivität + -Machbarkeit fraglich

Berichtziel

4.1 Synthesis of results

To answer the ***first and second research question*** to determine which evidence-based BIs are used in lifestyle counselling and which of the interventions and their characteristics are effective, a total of seven publications of six systematic reviews were included. Out of the six included systematic reviews, one each measured BI for physical activity and a healthy diet, while four examined BI for alcohol consumption.

effektive BI: 6 Systematic Reviews (SRs), 1 PA, 1 HD, 4 AC

The reviewed studies examined various **intervention types** for physical activity, healthy diet, and alcohol consumption. For physical activity, brief interventions typically included written supplementary materials, with sessions lasting 2-3 to 7-13 minutes and follow-up via visits, telephone calls, or newsletters. For healthy diet, the most common single-session approaches were education combined with feedback (26.6%), education alone (22.4%), and action/goal planning (16.3%), delivered predominantly through print materials (59.2%), in-person (12.2%), or internet-based formats (15.3%). For alcohol consumption, interventions were predominantly based on motivational interviewing or related approaches such as the FRAMES model and Motivational Enhancement Therapy, with session lengths varying from 3 minutes to two hours, often including multiple sessions with face-to-face contact or telephone follow-up, and additional elements such as diaries or home exercises.

verschiedene BI für PA (2-13 Min + FU + Info-material), HD (Einzelsitzungen, v. a. Aufkärung + Feedback) + AC (3 Min-2h, v. a. MI)

An umbrella review of three systematic reviews found that **brief physical activity interventions** (3-13 minutes) in primary care effectively increased self-reported physical activity over 4-12 weeks compared to usual care. Long-term results remain inconclusive. Follow-up sessions appear more decisive for effectiveness than session duration or materials, although evidence on session characteristics, providers, and settings remains insufficient. Follow-up components included visits, phone calls and newsletters.

1 PA-Review: Kurze BI erhöhen PA kurzfristig (4-12 Wochen); Follow-ups wahrscheinlich wichtiger als Dauer

A systematic review of 55 studies (23,327 participants) demonstrated that education represents one of the most extensively investigated brief interventions for **healthy diet counselling**. Educational materials or interventions alone exhibit limited effectiveness. However, when combined with feedback and/or tailored advice, single-session interventions demonstrated significant improvements, particularly increased fruit and vegetable consumption at six weeks and reduced fat intake at one to six months post-intervention. The comparative effectiveness of tailored feedback (+advice) as a component of educational interventions versus non-tailored approaches remains inconclusive across various outcomes (fruit, vegetable and fat intake) and follow-up periods (three weeks to three months). Nevertheless, one study demonstrated that tailored feedback (+advice) without educational components was superior to generic nutrition information, indicating potential sufficiency as a standalone intervention. Feedback effects remained consistent across diverse outcome measures (fruit/vegetable intake, physical activity, stress management). Positively framed motivational messages demonstrated superior efficacy for fruit intake compared to negatively framed messaging. Educational interventions incorporating goal/action planning showed no significant effect on healthy food intake versus no intervention at one to four months follow-up, whilst comparisons with education alone yielded inconclusive results. Action planning as a standalone intervention significantly reduced the percentage of energy intake from fat at one month post-intervention. Various action planning interventions proved effective in increasing fruit intake at one month, with the greatest effect size observed for action planning with specific instructions and examples (+0.1) compared to instructions only (+0.07) or no instructions (+0.05).

1 HD-Review: Aufklärung allein begrenzt wirksam; kombiniert mit Feedback/Beratung signifikante Verbesserungen

unklare Ergebnisse bzgl. maßgeschneiderter BI

positive Motivationsbotschaften wirksamer als negative

Aktionsplanung effektiv, v. a. mit Anleitung + Beispiel

An umbrella review of four systematic reviews demonstrated that BI for **alcohol consumption** vary regarding their content, length and follow-up sessions. Verbal information, advice or counselling (1-5 sessions) effectively reduces quantity, frequency, and heavy drinking prevalence of alcohol consumption at 12 months. Brief advice is most effective for reducing quantity and enhanced motivational interviewing (MI plus) for reducing frequency. The findings concerning the efficacy of BI for individuals experiencing common mental health challenges remain inconclusive. Follow-up sessions proved superior to single sessions.

4 AC-Reviews: BI reduzieren Menge, Häufigkeit starker Trinker (12 Monate); kurzer Hinweis am effektivsten auf die Menge; M-Plus auf Häufigkeit

To answer the ***third research question*** on the implementation requirements and barriers for brief lifestyle intervention within Austrian PMCU, a qualitative expert survey was conducted.

Expert:innenumfrage zur Implementierbarkeit

The survey results show that physicians face substantial **barriers** in lifestyle counselling, including patients' health literacy, their willingness to change, language barriers, and a considerable lack of time. At the same time, those who stand to benefit most from preventive care are not being reached. In order to enhance accessibility, it is proposed to disseminate periodic, systematic invitations to preventive medical check-up and to devise incentives to motivate patients (e.g. a bonus-malus system).

Barrieren: Gesundheitskompetenz, Änderungsbereitschaft, Sprachbarrieren, Zeitmangel

Survey results showed that implementing follow-up sessions in **physical activity counselling**, as identified as potentially effective in the systematic review, requires more time, appropriate remuneration, health insurance billing options, plus organisational considerations and specific materials.

PA spezifische FUs erfordern Zeit, Honorierung, Organisation, Material

Tailored feedback with advice incorporating positively framed motivational messages and/or action planning with specific instructions and examples has been shown to be effective for **healthy diet counselling** in the systematic review. Survey results show that the implementation of such interventions would overwhelm primary care practices. Implementation would require collaborations with dietitians, substantially increased consultation time, physician training, appropriate educational materials and nutrition plans, as well as adequate remuneration. A pragmatic solution could involve referral to nutrition counselling services, as already implemented by some practitioners. An annual nutrition counselling session integrated within routine check-ups, as proposed by one respondent, might also be feasible.

HD Interventionen überfordern Praxen; Mehrbedarf: Kooperation mit Diätolog:innen, Zeit, Training

Furthermore, survey findings demonstrate that adequate time allocation is the most important **requirement** for implementation, more important than material resources and financial incentives. The provision of multilingual educational material (e.g., leaflets, online brochures), appropriate remuneration structures, and enhanced interdisciplinary collaboration encompassing dietitians, psychotherapists, and social counsellors emerge as essential components for optimising the PMCU. Integrated community-based interventions (coffee parties, sports clubs, nutrition groups) and simple adaptations (clicks on the PMCU form, hydration communication, posters of pillars for healthy ageing) have the potential to enhance the PMCU with minimal effort.

Voraussetzungen zur Einführung: v. a. Zeit; mehrsprachige Materialien, Anreize, Kooperationen

4.2 Critical reflection

Study quality and methodology of included studies

The findings are derived from umbrella reviews and systematic reviews, indicating that not all data from the primary studies are accessible. This may also have contributed to the superficial characterisation of the brief interventions including the lack of standardised intervention duration, provider types, and settings, as well as insufficient descriptions of intervention procedures, counselling techniques, and materials used. This thereby restricts the scope of interpretation and the generalisability of the findings, as outlined in the next chapter.

***Limitationen:* limitierter Zugang zu Primärdaten; unzureichende Interventions-beschreibungen**

The results concerning the effectiveness of **counselling on physical activity** are based on an umbrella review with a high risk of bias due to the lack of a pre-registered protocol and an unblinded screening process. The systematic reviews included in this review are of moderate quality themselves. In the absence of empirical evidence, the effectiveness of the intervention was assessed exclusively based on self-reported physical activity, a measure susceptible to bias due to social desirability. The predominantly narrative synthesis of the review's outcomes leads to a lack of data on significance levels and clinical relevance, which would require an examination of the primary studies. The long-term effectiveness of the intervention is also highly uncertain, as significant effects were only determined up to 12 weeks after the intervention, while the evidence on long-term effects is limited and inconclusive.

PA-Review: Hohes Bias-Risiko; nur selbstberichtete PA; fehlende Langzeitdaten + Daten klinischer Relevanz

The results for **healthy diet counselling** are based on a systematic review with unclear risk of bias due to limited information. However, the included studies were consistently rated as having a low risk of bias, a judgement that two reviewers largely agreed upon. Nevertheless, outcome measurement methods (e.g., self-reported versus objective instruments) were not disclosed, preventing evaluation of potential measurement bias. Additionally, the clinical relevance of findings is unclear. For example, whether increases of +0.45 servings of fruit per day or reductions in fat scores of 0.7 ($p < 0.01$) following education and feedback interventions confer substantive health benefits remains uncertain. Furthermore, data of a longitudinal nature are also absent in this case. The majority of results on effectiveness refer only to periods of a few weeks to a few months; no data are available for periods longer than 12 months, which raises questions about the long-term effectiveness of the intervention.

HD-Review: unklares Bias-Risiko; Outcome-Mess-methoden + klinische Relevanz unklar; fehlende Langszeitdaten

The results of the **counselling on alcohol consumption** are based on reviews with varying risk of bias, two of which had a high risk of bias due to the lack of a pre-registered protocol. The majority of the reviews included did not provide information on outcome measures, but it is reasonable to assume that self-reported outcome measures associated with potential for bias were used due to feasibility. Although one review reported efficacy over 48 months, interpretation of long-term effects remains limited as this timeframe is insufficient to assess true sustainability, and all other reviews reported follow-up periods ≤12 months or did not specify duration.

AC-Review: variierendes Bias-Risiko; vermutlich selbstberichtete Outcomes; Follow-up meist ≤12 Monate

Across the entirety of BI, the brevity of the follow-up period is striking, raising questions about the sustainability of the interventions. Moreover, none of the interventions examined the effect on morbidity and mortality, leaving open the question of whether BI has an impact on the prolonged health of those who undergo intervention. Furthermore, the question of whether the effect sizes (if they persist) of the respective interventions would be sufficiently large to influence health remains unresolved.

kritische kurze FU-Dauer bei allen BI; Nachhaltigkeit unklar; fehlende Daten zu Effekten auf Morbidität + Mortalität

Generalisability

The transferability of the results to the Austrian PMCU is limited in part due to the conditions of the systematic review for effectiveness evaluation and the qualitative survey for implementation exploration.

limitierte Übertragbarkeit der Ergebnisse

The duration of **BI for physical activity** in the literature analysed varied in length, ranging from 2-3 minute sessions to 7-13 minute sessions. As asserted by one survey participant, the stipulated time limit of 15 minutes per patient, encompassing the medical history, physical examination and consultation, is ordinarily inadequate for the comprehensive nature of the consultation. In particular, the counselling of up to 13 minutes would not be a viable option. This could limit the generalisability of the results, but also raises the question of whether physicians utilise the second appointment of the PMCU for exclusively counselling as intended (scheduled to 15 minutes [64]), and combining the entire PMCU programme into 15 minutes may lead to the stated time constraints. However, it is important to note that the presence of a follow-up session may have a greater influence on the effectiveness of the intervention than the duration of the individual sessions themselves. Nevertheless, it appears unfeasible to deliver the intervention appropriately, given that it must address not only physical activity but all lifestyle domains. Furthermore, the umbrella review did not specifically define provider type, including general practitioners, nurses, and counsellors. This may limit direct transferabil-

PA: Übertragbarkeit der Beratungsdauer fraglich; unklare Übertragbarkeit der Anbieter (variiert) + Länder (nicht spezifiziert)

ity to the Austrian PMCU, which is conducted exclusively by physicians. However, the review authors noted insufficient evidence to identify significant effects related to provider type. Moreover, it should be noted that the countries in which the included RCTs were conducted were not specified, which raises questions about the transferability of the results to the Austrian context.

The results for **BI for healthy diet** are based on an average female participation rate of 70%. A gender-specific difference is also evident in Austria, although with a lower intensity, with ~18% of women and 16% of men participating in PMCU [3]. Information on the duration of the intervention was missing, which calls its transferability to the Austrian context into question. The healthy diet counselling was conducted in various settings, including universities, workplaces and online, indicating that these consultations were not necessarily provided by healthcare professionals and were therefore independent of medical parameters. It is essential to recognise that physicians hold a degree of prestige and trust, which can significantly amplify the impact of counselling interactions [1]. However, they also need to follow current dietary guidelines, which experts in this field (dieticians) may be more familiar with, as demonstrated by one respondent providing incorrect advice about calorie deficits. The majority of literature on the effectiveness of the programme originates from Europe and the UK (31 out of 45 studies), which substantiates the transferability of the programme's effectiveness to the Austrian context. However, it is worth noting that 11 studies from the USA are included. In the USA, there appears to be a greater need for change regarding weight and eating habits than, for example, in Sweden [65], which has a comparable obesity prevalence of approximately 23% [66] to that of Austria. However, a divergent individual's need to change may potentially introduce bias, thereby compromising the validity of the results.

HD: unklare Übertragbarkeit durch anderes Geschlechterverhältnis (70 % weiblich), fehlende Info zu Dauer, variierende Settings, unterschiedliche Anbieter (medizinisches + nicht-medizinisches Personal) + Länder (Europa + USA)

The findings on **BI for alcohol consumption** are based on studies involving different numbers of sessions, ranging from 1-2 sessions to 1-5 sessions. The Austrian PMCU delineates a maximum of one follow-up session, which is exclusively conducted in cases of harmful alcohol consumption [1, 34]. The duration of the sessions has not been reported, which limits the scope for full disclosure. The primary studies were conducted in diverse settings (predominantly general practices and primary care, but also emergency, university, and hospital settings) and involved various provider types (general practitioners, nurses, and counsellors), which may limit transferability to the Austrian PMCU context. The receptiveness of patients to counselling may be limited in such cases due to stress (emergency care) as well as a lack of relationship (hospital setting) and continuity, which are necessary for sustainable lifestyle change [67]. This may limit the transferability of the findings to primary care. A significant proportion of the included primary studies were conducted in the USA. A study shows that a limited number of Americans believe they need to change their alcohol consumption [65]. If fewer people recognise the need for behavioural change, this can lead to distortions in the interpretation of the effectiveness of lifestyle counselling for alcohol consumption. The implications for generalisability are therefore indicated as cautionary.

AC: unklare Übertragbarkeit von Sitzungen (1-5 Sitzungen), Settings (auch Notaufnahme, Krankenhaus), Ländern (viele Studien aus USA)

The lack of representativeness of the sample and the small number of participants limits the transferability of survey findings. The majority of participating physicians were based in Burgenland, Lower Austria, and Salzburg. The transferability of the findings to Austria in general is not guaranteed. A significant proportion of the respondents (~80%) were running general single or group practices; therefore, the generalisability of the findings to PMCU centres may be limited.

Survey: kleine, nicht-repräsentative Stichprobe; v. a. Einzelpraxen + regionale Einschränkungen

Evidenz wertvoll; spezifische Rahmenbedingungen zu beachten

In general, international evidence and exploratory findings provide valuable insights relevant to Austria. However, specific considerations regarding counselling length, setting conditions and social and structural circumstances must also be taken into account. Directly transferring the results without considering these contextual differences could limit the effectiveness of the interventions in Austria. Therefore, due to the uncertainties involved, accompanying research would be essential when implementing specific strategies.

Implementation

The feasibility of specific lifestyle counselling in Austrian PMCU needs to be considered in light of their general challenges and requirements.

Zielgruppe als Kernherausforderung: Gesundheitskompetenz, fehlende Änderungsbereitschaft, Sprachbarrieren

The survey results show that physicians perceive the PMCU target group as the greatest challenge in lifestyle counselling. This includes low health literacy, reluctance to change, and language barriers – consistent with half of Austrians demonstrating limited health literacy [39] and highlighting why counselling currently fails to achieve desired effects. One potential approach to addressing reluctance to change could be integrating the 5R framework [68]. In contrast to the prevailing 5A counselling approach, the 5R framework is specifically designed for individuals who are reluctant to modify their behaviour [68].

Informationsmaterial existiert; unzureichend bekannt; Materialbedarf widerspricht Evidenz (Aufklärung allein ineffektiv)

According to the respondents, there is a need for leaflets, visual aids, websites, and online brochures or information sheets that are available in multiple languages and are simple to understand. Educational and informational material is available from recognised Austrian and German institutions (see Box 1. Educational and informational material) in the form of information brochures, tips, videos and webinars. However, it appears that this is not reaching medical professionals sufficiently, thus highlighting the need for bundled and easily accessible information materials that are available in multiple languages, as it is currently only accessible in German.

Box 1. Educational and informational material

Physical Activity

https://www.gesundheitskasse.at/cdscontent/load?contentid=10008.790031&version=1743670703

https://www.gesundheitskasse.at/cdscontent/?contentid=10007.894705&portal=oegkportal

https://fgoe.org/sites/fgoe.org/files/2023-03/Broschuere_Bewegung_2023_bfrei_0.pdf

https://fgoe.org/sites/fgoe.org/files/inline-files/fgoe_leichter_lesen_GF_bfrei.pdf

Healthy diet

https://www.gesundheitskasse.at/cdscontent/?contentid=10007.889842&portal=oegkportal

https://www.gesundheitskasse.at/cdscontent/?contentid=10007.889844&portal=oegkportal

https://gesundheitsfonds-steiermark.at/gesunde-ernaehrung/ernaehrungsbroschueren-und-berichte/#allgemeinebroschueren

https://www.dge-medienservice.de/medien-zum-download.html

Alkohol consumption

https://www.gesundheitskasse.at/cdscontent/?contentid=10007.904302&portal=oegkportal

https://www.kontaktco.at/shop/pdf/101-09.pdf

https://www.dhs.de/infomaterial

Fortbildungsbedarf (zur Verbesserung von Wissen + Beratungskompetenz (Steigerung der Patient-Berater-Beziehung)

However, this need contradicts the insights that educational material alone is not sufficient, at least when it comes to advising on healthy eating. Conversely, training programmes for doctors have been shown to enhance their knowledge and advisory skills [69, 70], which may result in an augmented ability to assist patients in modifying their behaviour and strengthening their health literacy. This issue carries particular significance given that outdated knowledge is sometimes conveyed through the utilisation of counselling techniques that are no longer considered effective. For instance, one respondent explains to her patients that weight reduction can be achieved through a calorie deficit, even though counselling on low-calorie diets in conjunction with physical activity is often characterised by a lack of compliance and sustainability [71]. Training programmes merit consideration to strengthen the relationship between counsellor and patient, which is evidenced as essential for intervention success [67]. This is particularly pertinent as the attitude towards patients expressed by some participants ("patients have bad habits") contradicts current communication models such as motivational interviewing.

Steigerung bevölkerungsweiter Gesundheitskompetenz mittels zielgruppenspezifischer Public Heath Interventionen

strukturierte VU-Einladungen: Steigerung Erreichbarkeit

The issue of poor health literacy should be considered not only on a micro level, but also against the backdrop of macro-structural factors. The improvement of the population's education regarding lifestyle-related diseases, for instance, through educational programmes in schools, media campaigns, or education as part of occupational health management, has the capacity to enhance health literacy and health behaviour [72, 73], thereby paving the way for the facilitation of lifestyle counselling. Such public health approaches have the potential to address a further issue that has been identified in relation to the target group. The respondents emphasised that it is precisely those people who require PMCUs that are not being reached. A lower frequency of annual health check-ups has been observed among younger individuals, those with a low socioeconomic status, and those with a migration background [74]. The implementation of health literacy campaigns, meticulously tailored to the demographics of these target groups, has the potential to enhance understanding of lifestyle-related diseases and the importance of preventive care [75, 76]. When employed in conjunction with systematic and structured invitations to PMCU, as recommended by the survey respondents, these campaigns may augment the accessibility of the target demographic in need.

Ausbau von Kooperationen/ Überweisungen zur zeitlichen Entlastung

kritische Reflektion ärztlicher Zeitnutzung: Abweichung von vertraglichen Vorgaben

In addition to the target group for PMCU, physicians also perceive the limited time frame as a significant challenge, a problem that is recognised as prevalent in general practices [77]. To alleviate physicians' time constraints, enhanced cooperation and referral opportunities could be established, thereby enabling greater delegation of lifestyle counselling to specialised health professionals. The respondents themselves suggest this approach as a potential solution. The observed time constraints warrant consideration of whether physicians adhere to the contractually specified session structure. Respondent ID014, for example, reported conducting medical history, physical examination, and consultation within a combined 15-minute timeframe, resulting in inadequate counselling time. This practice deviates from contractual provisions stipulating 15 minutes solely for consultation [64], suggesting that time limitations may partly reflect organisational practice rather than insufficient allocated time.

Ernährungsberatung: Überweisung sinnvoll (Training, Langzeit-FU für Adipositas erforderlich)

…

Dietary counselling interventions appear particularly suitable for referral to specialised health professionals (dietitians, nutritional counsellors), as the evidence-based brief interventions identified exceed the capacity constraints of general practice settings according to respondents. Responses also show that healthy diet interventions require specific training and skills due to their

complexity, something which is not currently implemented in Austria. In addition, adequate obesity management requires long-term follow-up, as stipulated by a guideline from the National Institute for Health and Care Excellence (NICE) [67], which cannot be adequately provided within general practice or primary care examination centres. The implementation of referral pathways to dietitians and nutritional counsellors necessitates appropriate structural frameworks (collaborative partnerships, inclusion in reimbursement schemes) and clinical decision-support tools. Given that general referral is problematic in times of scarce resources, it is particularly urgent to limit referral to groups of individuals at risk who are likely to benefit from such interventions. For instance, the Healthy Eating Index (HEI) [78] identifies healthy dietary patterns associated with a reduced risk of cardiovascular disease and stroke [79]. This index is based on the Dietary Guidelines for Americans [80] and could be adapted for the Austrian population, as demonstrated by an Italian example [79]. The HEI-2020 comprises 13 dietary components, each with scores ranging from 0 to 100, where higher scores reflect greater adherence to dietary guidelines and superior nutritional quality [78].

… Überweisungspfade erfordern Kooperationen, Finanzierung, Entscheidungshilfen für zielgruppenspezifische Beschränkungen (ressourcensparend)

A potential approach could involve dietary quality assessment (e.g., using the Healthy Eating Index) coupled with tiered counselling analogous to established alcohol screening and counselling protocols [1]. For individuals with suboptimal dietary patterns, structured feedback and dietary advice could be implemented, which has been demonstrated to be effective in reducing fat intake and increasing fruit and vegetable consumption. Such counselling interventions might be supported by an existing individualised conversation guide [81]. Poor dietary quality could warrant referral to specialised nutritional counselling services as an option. Systematic approaches to ensure referral uptake should be considered an important implementation aspect. This approach may offer particular advantages for individuals with obesity by potentially mitigating weight stigma-related barriers [82], as the emphasis is placed on healthy dietary behaviours rather than weight reduction.

gestuftes Beratungskonzept mit Healthy Eating Index als Entscheidungshilfe (Gewichtsstigmatisierung vermeidend)

Brief **physical activity interventions** have demonstrated short-term efficacy if they are implemented as described in the studies. As sustained effectiveness may be primarily attributable to follow-up sessions, the introduction of such supplementary consultations could potentially be considered, albeit within the context of limited supporting evidence. According to surveyed physicians, implementation could theoretically be feasible but would necessitate additional time allocation, appropriate remuneration, general reimbursement, and organisational adaptations, as well as specific resources. Follow-up sessions might encompass components beyond face-to-face counselling, including telephone consultations and newsletter communications. Digital tools could potentially be considered for follow-up session implementation, guided by NICE guidelines on digital behavioural change interventions [83].

PA-FUs implementierbar, zusätzliche Ressourcen nötig (Zeit, Honorar, organisatorische Aspekte)

mögliches Potential digitaler Lösungen

The evidence on the efficacy of **counselling for alcohol consumption** does not provide any insights into more effective BI that go beyond existing counselling using AUDIT with a subsequent follow-up appointment for individuals exhibiting harmful alcohol consumption patterns. This finding is consistent with a primary study showing no advantages of extended interventions compared to brief counselling after 12 months [84]. Consequently, the implementation of additional counselling interventions does not appear to be justified at this time.

aktuelles AUDIT-basiertes Vorgehen evidenzbasiert ausreichend

komplexe Gesundheitsprobleme erfordern ganzheitliche Ansätze

rezente Erprobung von Social Prescribing in Ö

Schwedisches Lebensstilprogramm zeigt signifikante Effekte

The inherent complexity of lifestyle-related diseases and their risk factors, as well as the challenges in addressing these multifaceted issues adequately, is reflected in the broad range of interventions considered necessary by healthcare providers. Irrespective of specific counselling objectives, referral pathways to psychotherapy and social counselling services are deemed essential. Additionally, there is a perceived need for measures addressing loneliness (e.g., meditation sessions, social coffee groups) and potential collaboration with sports clubs, nutrition groups, and psychological support services. The introduction of comprehensive programmes could potentially provide a unified approach to such complex health presentations. Examples could include social prescribing, which is already being trialled in some primary care centres across Austria and is currently being assessed by the Austrian Institute for Health Technology Assessment [85] with a view to possible expansion. A further promising example is demonstrated by a Swedish structured lifestyle programme in primary care, which achieved significant improvements in PA levels, dietary habits, smoking cessation, and reductions in stress and sleep difficulties among individuals with high cardiovascular risk [86].

Praxis-Standards-Diskrepanz (5As, Handbuch nicht erwähnt; veraltete Techniken/Wissen)

strukturelle Herausforderungen; Prüfung des Potentials von Public Health (PH) Interventionen

Overall, the survey results indicate a potential gap between current medical practice and the standards for PMCU in Austria outlined in the introduction (e.g., use of the manual, 5As). None of the recommended instruments were mentioned by participants; instead, outdated counselling techniques and knowledge were cited. Whilst these findings must be interpreted cautiously given the study's limitations outlined below, they raise concerns about the extent to which evidence-based lifestyle counselling is implemented in practice. In addition, the challenges in implementing lifestyle counselling arise substantially from structural-level factors. Beyond adaptations to lifestyle counselling for physical activity and healthy eating at the micro-level of PMCU, lifestyle-related diseases should correspondingly be addressed at the macro-level. Evidence on further public health measures such as sugar taxation [87] or infrastructure for physical activity should be assessed on whether to potentially complement noncommunicable disease prevention at the structural level. This appears particularly relevant, as drivers of unhealthy lifestyle behaviours are fundamentally rooted in social, commercial, and physical environmental factors [23].

4.3 Limitations

Informationsverlust durch Synthese von Reviews

To address the question of effectiveness of existing BI (RQ1 and RQ2), the umbrella review incorporated both systematic reviews of systematic reviews and systematic reviews of primary studies, which partially resulted in information loss, particularly for systematic review of systematic reviews (lifestyle counselling for physical activity and alcohol consumption), and complicated comparative analysis. This can be explicitly attributed to the synthesis of various review types for evidence regarding BI for alcohol consumption.

Ausschluss digitaler Tools + Reviews mit mangelhafter BI-Definition …

Methodologically justified, only studies published in 2015 or later were included to ensure currency and transferability to contemporary conditions. Studies investigating counselling via digital tools were excluded due to poor fit with the Austrian preventive care context, potentially limiting opportunities for digital advancement of PMCU. Studies were frequently excluded due

to the absence of precise definitions of BIs and their duration, or a lack of temporal specifications for BIs (e.g., Curry et al., 2018 [88]). Accordingly, no claim to comprehensive evidence coverage is made.

… kein Anspruch auf vollständige Evidenzabdeckung

For the qualitative investigation addressing the implementation of evidence-based BI, we were required to deviate from the pre-registered protocol due to time constraints. Instead of semi-structured expert interviews, a qualitative questionnaire survey was conducted among healthcare professionals. The small sample size (n=10) restricts the validity of the findings, and the lack of representativeness limits the transferability of results to broader populations. Consequently, findings should be interpreted with considerable caution. The qualitative questionnaire contained open-ended questions that allowed respondents to provide free-response options, thereby enabling the discovery of unexpected findings. Nevertheless, specific follow-up questions and individualised adaptations to conversation flow were not possible, which was reflected in very brief responses from participants and left the background of some statements unanswered. For instance, it remains unclear what is meant by "updating the blood parameters" (ID014) or how hydration requirements (ID011) are relevant to counselling sessions.

Protokollabweichung: Fragebogen statt Interviews

kleine Stichprobe (n=10) limitiert Validität

eingeschränkte Übertragbarkeit (fehlende Repräsentativität)

kurze Antworten, keine Nachfragemöglichkeit; Kontext fehlt teilweise

4.4 Further research and development requirements

To improve the generalisability of results, more detailed descriptions of brief interventions are required, including standardised information on intervention duration, provider types, setting, procedures, counselling techniques, and materials used. For adequate transferability to the Austrian PMCU, future research should focus on single sessions of 15 minutes or less delivered by general practitioners in primary care, with comprehensive descriptions of counselling techniques and tools.

Bedarf detaillierte BI-Beschreibungen + Einschränkung auf Einzelsitzungen

Current evidence suggests that extending physical activity counselling to include follow-up sessions enhances effectiveness. To validate these findings initially, further research would be beneficial, particularly direct comparisons of brief interventions (single session) with and without follow-up sessions. A systematic review of primary studies could minimise heterogeneity regarding duration, setting, and number of sessions, whilst improving transferability of results to the Austrian context. Where feasible, this should be restricted to European contexts, with a maximum counselling duration of 15 minutes. Alternatively, systematic comparisons of different counselling durations should be considered to gain insights into feasibility and the requirements for duration extension. As physical activity counselling is a public health intervention frequently evaluated through qualitative research, the inclusion of qualitative studies should be considered. Furthermore, future investigation into the potential of digital tools for lifestyle counselling is important, particularly as instruments for follow-up sessions.

PA: vergleichende Untersuchung BI mit vs. ohne FU; verschiedener Beratungsdauer + otential digitaler Tools für FU-Sitzung

Effective brief interventions for a healthy diet often exceed general practice capacity, according to physicians' perspectives. Whether this applies equally to PMCU centres remains unclear, necessitating a cluster-design investigation. A pragmatic approach to enhancing nutritional counselling in the context of limited time and financial resources could involve the establishment

HD: Klärung von Kapazitätsunterschieden (Praxen vs. VU-Zentren); Leitlinienentwicklung für Überweisungspfade

of referral pathways to suitable specialists for specific risk groups including, for example, those at risk for cardiovascular diseases, cancer and stroke. This would require the development of guidelines with decision support systems, for example, using scoring systems analogous to those used in alcohol screening procedures, as described in the preceding chapter.

Longitudinalstudien erforderlich (inkl. Mortalität/Morbidität)

Longitudinal studies are needed to examine whether implemented interventions achieve sustainable behavioural changes. Additionally, insights regarding the impact on long-term morbidity and mortality are lacking.

Zusammenstellung + mehrsprache Übersetzung von Informationsmaterialien

Ermittlung der Effektivität und Implementierbarkeit von Fortbildungen + Anreizen

Independent of explicit lifestyle counselling for physical activity and a healthy diet, practitioners encounter challenges that generally complicate lifestyle counselling, whilst identifying approaches to address these. Although evidence demonstrates no effectiveness for educational materials alone regarding a healthy diet, these would assist physicians in counselling. Existing information materials could be collated, translated into multiple languages, and distributed digitally to contracted physicians in a bundled format. Training programmes could strengthen physicians' knowledge and counselling competencies, thereby improving their ability to guide patients' behavioural changes and enhance health literacy. Research is needed regarding the effectiveness and implementability of training programmes in Austria, as well as other suggested improvements such as incentives.

Bedarf großangelegter Ist-Analyse

Despite the exploratory research approach, the practical application of lifestyle counselling and the counselling techniques and tools used by physicians remain unclear. Large-scale situational analysis would be necessary to improve the design of explicit counselling consultations.

partizipative + Health-Equity Forschung

The question of how to actually reach individuals who require PMCU and lifestyle counselling should also be addressed. Participatory and health equity-focused research could provide insights through qualitative barrier analyses, systematic evaluations of incentive programmes, or comparative studies of invitation modalities and access mechanisms.

5 Conclusion

VU-Update fällig; Bericht bietet Effektivitätsanalyse von Kurzinterventionen + Implementierbarkeit in VU

Following the last update of the PMCU in 2005 and the partially deteriorated lifestyle-related behaviours among the population, the Austrian PMCU programme faces the challenge of advancing lifestyle counselling. This report provides a comprehensive analysis of the effectiveness of brief interventions for promoting physical activity, a healthy diet, and reducing alcohol consumption, while simultaneously addressing practical implementation challenges within the Austrian preventive care context.

differenzierte Wirksamkeit von BIs nach Lebensstilbereich

PA-BI kurzfristig wirksam

HD-BI: Feedback, Motivation, Planung wirksamer als Aufklärung

AC-BI: aktuelles Vorgehen ausreichend

The identified evidence-based brief interventions demonstrate differentiated efficacy profiles. Brief physical activity interventions were effective in the studies assessed in the short term for increasing self-reported physical activity over 4-12 weeks, with follow-up sessions appearing more decisive for effectiveness than either session duration or materials. For dietary counselling, passive educational approaches alone exhibited limited effectiveness, whilst active behavioural components such as education and tailored feedback with advice, positively framed motivational messages, as well as action planning with specific instructions, achieved significant improvements. Brief interventions for alcohol consumption demonstrated efficacy in reducing consumption frequency and quantity over 12 months, with the AUDIT screening and structured counselling already implemented in Austrian PMCU appearing sufficient.

Abweichende Praxis von VU-Richtlinien

Comparing study evidence with clinical practice insights from the survey reveals that Austrian practice does not align with key guideline standards. Therefore, lifestyle counselling in its current form in Austria is unlikely to achieve the effects demonstrated in the studies.

Herausforderungen: Gesundheitskompetenz, Motivation, Sprache, Zeit

ambivalentes Zeitproblem (Abweichung vertraglicher Vorgaben)

effektive HD-intervention überfordert Praxen

The qualitative survey of physicians reveals substantial barriers to implementation. The target population of PMCU is identified as the primary challenge, including inadequate health literacy, low motivation for change, and language barriers. Time restrictions constitute a further substantial barrier, with adequate time allocation identified as the most important challenge. However, survey findings suggest a discrepancy between contractually specified timeframes and actual practice patterns. Efforts should therefore focus on aligning clinical practice with contractual provisions to ensure adequate time for comprehensive lifestyle counselling. According to respondents, effective dietary interventions often exceed the capacity of general practices, suggesting the need for structured referral pathways for at-risk groups to nutrition specialists.

Bedarf: Honorierung, Kooperationen, Material, Standardausrichtung

A central insight is the structural issue whereby individuals with the highest prevention needs are not being reached. To improve accessibility, systematic invitation procedures for preventive examinations and incentive systems are proposed. The complexity of lifestyle-related diseases is reflected in the broad range of required interventions, encompassing referral pathways to psychotherapy, social counselling, and community-based interventions extending beyond specific lifestyle counselling.

Einschränkungen: Methodik, Übertragbarkeit, Langzeiteffekte

The report identifies methodological limitations of the underlying evidence, including heterogeneous study designs, unclear relevance of the effect sizes demonstrated and insufficient long-term data on sustainable behavioural changes, as well as impacts on morbidity and mortality. The transferability of international findings to Austria is constrained by variations in counselling duration, healthcare settings, and differing healthcare systems and policy contexts in the countries where studies were conducted.

The findings demonstrate the necessity of a multimodal approach to optimise lifestyle counselling within Austrian PMCU. Beyond implementing evidence-based brief interventions with follow-up components for physical activity counselling and risk-group-specific referrals to dietitians, structural adjustments might include: development of appropriate remuneration frameworks, establishment of interdisciplinary collaborations, provision of multilingual information materials, and alignment of clinical practice with PMCU standards. Furthermore, lifestyle-related diseases should be addressed through public health measures at the macro level, as drivers of unhealthy lifestyle behaviours are also embedded in social, commercial, and physical environmental factors.

multimodaler Ansatz zur VU-Weiterentwicklung (zzgl. Folgeforschung): FU für PA, gruppenspezif. Überweisungen (HD), Honorierung, Kooperationen, Material, Standardausrichtung, PH Interventionen

Further research is required to validate the long-term effectiveness of brief interventions, evaluate follow-up sessions for physical activity counselling and to develop Austria-specific referral implementation strategies. The findings of this report serve as a foundation for the evidence-based development of lifestyle counselling within Austrian PMCU and the establishment of supportive structural frameworks.

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Appendix

Appendix-I: Recommended preventive medical check-ups

Erkrankung/ Risiko-faktor	Population	Klassifizierung	Untersuchung/Beratung	Klassifizierung	Screening-Intervall	Klassifizierung	Möglicher Änderungsbedarf
Kardiovskuläre Erkrankungen und Risikofaktoren							
Abdominales Aortenaneurysma	Männer zwischen 65 und 75 Jahren	✓✓	Abdominale Sonographie	✓✓	Screening-Intervall: Einmalig	✓✓	Nein
Alkoholkonsum	Erwachsene ≥ 18 Jahre	◇	AUDIT-C-Fragebogen zum Selbstausfüllen, einzelne Frage	◇	Bei jeder Vorsorgeuntersuchung	○	Nein
			Entwöhnungsberatung, Überweisung zu einer spezialisierten Behandlung für Alkoholkrankheiten	✓			
Körperliche Aktivität	Erwachsene ≥ 18 Jahre	✓	Beratungsgespräch, um zu regelmäßiger körperlicher Bewegung im Alltag zu motivieren (5 ES)	✓	Screening-Intervall: Bei jeder Vorsorgeuntersuchung	○	Nein
Diabetes mellitus Typ 2	Erwachsene ≥ 18 Jahre	◇	Feststellung des Diabetesrisikos mittels FINDRISK	✓	3 Jahre (Bestimmung Nüchtern-Blutzucker, HbA1C)	✓ (3-5 Jahre)	Nein
			HbA1C, Glukose-Toleranztest	✓✓			
Hypertonie	Erwachsene ≥ 18 Jahre	✓✓	Blutdruckmessung	✓✓	Individuell abgestimmt	✓✓	Nein
Lipidstoffwechselstörung	Erwachsene ≥ 18 Jahre	~	Gesamtcholesterin, HDL, LDL-Cholesterin Quotient, Triglyzeridbestimmung	✖	5 Jahre (ohne erhöhtes Risiko), individuell abgestimmt (mit erhöhtem Risiko)	○	Ja
Nikotin/Tabakkonsum	Erwachsene ≥ 18 Jahre	✓	Erhebung des Rauchstatus mittels Fünf Es-Befragung	✓	Screening-Intervall: Bei jeder Vorsorgeuntersuchung	○	Nein
			Entwöhnungsberatung (Fünf Es; Motivationsanstöße, Zuweisung zu spezialisierter Entwöhnungseinrichtung)	✓			
Übergewicht/Adipositas	Erwachsene ≥ 18 Jahre	✓	BMI und/oder Taillenumfang als Teil der physikalischen Statuserhebung	✓/○	Bei jeder Vorsorgeuntersuchung (BMI und/oder Taillenumfang)/Jährlich (Beratung von BMI >25 kg/m² mit Komorbiditäten bzw. >30 kg/m²)	✓/○	Nein
			9 BMI >25 kg/m² mit Komorbiditäten bzw. >30 kg/m²: Gewichtsreduktion unterstützen (Ernährungsempfehlung, Beratung zu körperlicher Aktivität unterstützt durch verhaltenstherapeutische Techniken)	✓			

Krebserkrankungen							
Kolorektales Karzinom	Erwachsene ≥ 50 Jahre	✓✓	Test auf fäkal okkultes Blut (FOBT)	✓✓	Screening-Intervall: Bei jeder Vorsorgeuntersuchung (FOBT)	✓✓	Nein
			Überweisung zu einer Fachärztin/einem Facharzt mit Berechtigung zur Durchführung der Vorsorgekoloskopie	◇	10 Jahre (Koloskopie)	✓	
Hautkrebs	Erwachsene ≥ 18 Jahre	✓	Beratung zur Prävention von Hautkrebs	✓	Screening-Intervall: Einmalig	○	Nein
Senium							
Altersbedingte Sehschwäche	Erwachsene ≥ 65 Jahre	✖	Gezielte Frage zu Frage nach Sehverschlechterung, optional Sehüberprüfung mittels Sehtafeln	~	Screening-Intervall: 2 Jahre	○	Ja
			Weiterführende Abklärung durch die Vorsorgeärztin/den Vorsorgearzt oder Veranlassung fachärztlicher Untersuchung	○			
Hörminderung/ Hörverlust	Erwachsene ≥ 65 Jahre	✖	Frage zu Hörverlust	~	Screening-Intervall: 2 Jahre	○	Ja
Osteoporotisches Frakturrisiko	Erwachsene ≥ 50 Jahre	~ für Männer ◇ für Frauen	FRAX Risikorechner	○	Screening-Intervall: 10 Jahre (FRAX)	○	Ja
			Personen mit erhöhtem Risiko ≥20 % weitere Abklärung durch DXA	✓			
			Beratung zur Vermeidung des Sturzrisikos	○			
Andere Erkrankungen							
Chronische Nierenerkrankungen	Erwachsene ≥ 40 Jahre mit mind. einem Risikofaktor (arterielle Hypertonie, Diabetes mellitus, Adipositas (BMI > 30 kg/m^2) oder terminale Niereninsuffizienz in der Familie)	✓	Albumin-/Kreatinin-Quotient aus dem Spontanharn und auf Serum-Kreatinin/eGFR aus dem Blut	✓	Screening-Intervall: 2 Jahre	○	Nein
Parodontalerkrankungen	Erwachsene ≥ 18 Jahre	○	Gezielte Frage zu Paradontalerkrankungen; Weiterführende Abklärung durch Vorsorgearzt/-ärztin oder Zuweisung parodontologisch orientierte Zahnarzt/-ärztin	○	Screening-Intervall: 3 Jahre (18-39 Jahre) 2 Jahre (≥40 Jahre)	○	Ja

Abbreviations: ✓✓… Klare Empfehlung für Maßnahme; ✖✖ … Klare Empfehlung gegen Maßnahme; ✓… Schwache Empfehlung für Maßnahme; ✖ … Schwache Empfehlung gegen Maßnahme; ◇ ... Gegensätzliche Empfehlungen der Institutionen; ~ … Unklare Empfehlungen; ○ … Keine Empfehlungen

Appendix-II: Questionaire of qualitative survey

Lebensstilberatung in der Vorsorgeuntersuchung

Einführung

Herzlichen Dank für Ihre Zeit! Mit Ihrer Teilnahme an dieser Befragung (~10 Minuten) tragen Sie zur Entwicklung offizieller Empfehlungen zur Weiterentwicklung der österreichischen Vorsorgeuntersuchung bei. Alle Ihre Angaben werden streng vertraulich behandelt und ausschließlich anonymisiert ausgewertet. Eine Rückverfolgung zu Ihrer Person ist nicht möglich. Die Daten werden gemäß der Datenschutz-Grundverordnung (DSGVO) verarbeitet, ausschließlich für wissenschaftliche Zwecke verwendet und nach Projektabschluss (spätestens nach 5 Jahren) gelöscht. Verantwortlich für die Datenverarbeitung ist das AIHTA. Da es sich um Expert:innen-Interviews handelt, ist für diese Studie kein Ethikvotum erforderlich. Ihre Teilnahme ist freiwillig. Sie können die Befragung jederzeit ohne Angabe von Gründen beenden. Durch das Ausfüllen des Fragebogens erklären Sie sich mit der anonymisierten Verwendung Ihrer Daten einverstanden. Kontakt: Bei Fragen zur Studie oder technischen Problemen wenden Sie sich gerne an: jule.pleyer@aihta.at oder +43 (0) 12 36 8119 – 28

In dieser Umfrage sind 13 Fragen enthalten.

Teil I: Einleitende Angaben

1. In welchem Bundesland führen Sie zurzeit Vorsorgeuntersuchungen durch?
   - ☐ Burgenland
   - ☐ Kärnten
   - ☐ Niederösterreich
   - ☐ Oberösterreich
   - ☐ Salzburg
   - ☐ Steiermark
   - ☐ Tirol
   - ☐ Vorarlberg
   - ☐ Wien

2. In welchem Setting führen Sie Vorsorgeuntersuchungen durch?
   - ☐ Vorsorgeuntersuchungszentrum
   - ☐ Einzel- oder Gruppenpraxis
   - ☐ Sonstiges: _____

3. Welcher Vertragstyp trifft auf Sie zu?
   - ☐ Vorsorgeuntersuchung allgemein
   - ☐ Andere Vorsorgeuntersuchung, und zwar: _____

4. Haben Sie im Rahmen der Vorsorgeuntersuchung in den letzten 6 Monaten Lebensstilberatung durchgeführt? *(Mehrfachauswahl möglich)*

   - ☐ Ja, in Bezug auf körperliche Bewegung
   - ☐ Ja, in Bezug auf gesunde Ernährung
   - ☐ Ja, in Bezug auf Alkoholkonsum
   - ☐ Keine oder andere Lebensstilberatungen (z. B. Rauchen, Sexualverhalten)

Teil II: Ihre Erfahrungen mit Lebensstilberatung

Filter: Wenn ja in Frage 4, weiter mit Frage 5 und 6a).
Wenn keine odere andere Lebensstilberatung in Frage 4, weiter mit Frage 6b)

---

5. Beschreiben Sie bitte, wie Sie aktuell Lebensstilberatung in Ihren Vorsorgeuntersuchungen durchführen.

Denken Sie dabei an Ihre typische Vorgehensweise:
Welche Themen sprechen Sie an? Wie gehen Sie vor? Welche Hilfsmittel nutzen Sie?

[Freies Textfeld]

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6. Herausforderungen bei der Lebensstilberatung:

   a) Welche konkreten Herausforderungen erleben Sie bei der Lebensstilberatung in Ihrem Praxisalltag? Beschreiben Sie ein typisches Beispiel aus Ihrer Erfahrung.

   b) Was würden Sie konkret benötigen, um diese Lebensstilberatungen in Ihren Vorsorgeuntersuchungen zu etablieren?

Denken Sie dabei an verschiedene Bereiche:
Welches Wissen oder welche Kompetenzen fehlen Ihnen? Welche strukturellen Veränderungen wären notwendig? Welche konkreten Tools, Materialien oder Ressourcen würden Sie benötigen? Welche organisatorischen oder finanziellen Rahmenbedingungen müssten geschaffen werden?

[Freies Textfeld]

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7. Was würde Ihnen helfen, die Lebensstilberatung in Ihren Vorsorgeuntersuchungen zu verbessern?

Denken Sie dabei an alles, was für Sie hilfreich wäre: z. B. Fortbildungen, Materialien, strukturelle Veränderungen, mehr Zeit, Tools, Unterstützung …

[Freies Textfeld]

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8. Inwieweit kooperieren Sie für die Lebensstilberatung mit anderen Berufsgruppen?

Denken Sie dabei an alle Formen der Zusammenarbeit: Welche anderen Berufsgruppen sind involviert? Wie gestaltet sich diese Kooperation? Falls Sie nicht kooperieren – sehen Sie Potenzial für eine solche Zusammenarbeit?

[Freies Textfeld]

Teil III: Evidenzbasierte Ansätze

9. Körperliche Aktivität – Follow-up Beratung

Die Evidenz zeigt positive Effekte einer Folgesitzung bzw. Follow-up Beratung bei der Bewegungsberatung.

Was bräuchten Sie, um eine solche Follow-up Beratung praktisch umzusetzen?

Denken Sie an alle Voraussetzungen:
z. B. zeitliche Ressourcen, organisatorische Aspekte, finanzielle Rahmenbedingungen, Materialien …

[Freies Textfeld]

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10. Gesunde Ernährung – Maßgeschneiderte Intervention

Die Evidenz deutet darauf hin, dass maßgeschneiderte Interventionen (Aufklärung, individuelles Feedback zur aktuellen Nahrungsaufnahme und Ernährungsberatung) mit positiver/motivierender Botschaft in Kombination mit Aktions-/Zielplanung positive Effekte auf die Ernährung haben.

Was benötigen Sie, um eine solche maßgeschneiderte Ernährungsintervention mit Aktions-/Zielplanung praktisch umsetzen zu können?

Denken Sie an alle Voraussetzungen für die Implementierung: Welche zeitlichen Ressourcen, welche Fortbildungen, welche Materialien oder Tools, welche strukturellen Rahmenbedingungen wären notwendig?

[Freies Textfeld]

Teil IV: Abschluss

11. Was möchten Sie uns sonst noch zur Lebensstilberatung oder zur Vorsorgeuntersuchung allgemein mitteilen?

Hier ist Platz für alles, was Ihnen wichtig ist und bisher nicht zur Sprache kam.
Ihre Anregungen, Wünsche, Bedenken oder Ideen sind wertvoll für uns.

[Freies Textfeld]

Vielen herzlichen Dank für Ihre Teilnahme und Ihre wertvollen Einblicke!

Ihre Antworten helfen uns dabei, praxistaugliche Empfehlungen für die Weiterentwicklung der Lebensstilberatung in der Vorsorgeuntersuchung zu entwickeln.

Leiten Sie diese Umfrage weiter an Ihre Kolleg:innen der Vorsorgeuntersuchung hier https://jpleyer.limesurvey.net/232613?lang=de

Appendix-III: Recruitment E-Mail for physicans

Sehr geehrte/r Frau/Herr xxx,

im Auftrag des Dachverbandes der österreichischen Sozialversicherungsträger führt das Austrian Institute for Health Technology Assessment (AIHTA) eine Studie zur Weiterentwicklung der Vorsorgeuntersuchung durch. Unser Fokus liegt dabei auf der Lebensstilberatung zu Ernährung, körperlicher Aktivität und Alkoholkonsum.

Warum wir Sie brauchen: Als erfahrene/r Praktiker/in, der/die Vorsorgeuntersuchungen durchführt, besitzen Sie wertvolle Einblicke in die täglichen Herausforderungen und Chancen der Lebensstilberatung. Ihre Perspektive ist entscheidend, um praxistaugliche Empfehlungen zu entwickeln.

Was wir von Ihnen erbitten:

- Teilnahme an dieser **Befragung** (**ca. 10 Minuten**)
- Ihre ehrliche Einschätzung zu aktuellen Praktiken und Hindernissen
- Ihre Vorschläge für Verbesserungen

Ihr Nutzen:

- Direkter Einfluss auf die Weiterentwicklung der Vorsorgeuntersuchung
- Beitrag zur Verbesserung der Bevölkerungsgesundheit
- Ihre Erfahrungen liefern einen Beitrag zur Entwicklung offizieller Empfehlungen

Teilnahme: Ihre Teilnahme ist freiwillig. Sie können die Befragung jederzeit ohne Angabe von Gründen beenden. Durch das Ausfüllen des Fragebogens erklären Sie sich mit der anonymisierten Verwendung Ihrer Daten einverstanden.

Zur Umfrage: Klicken Sie hier, um die Umfrage zu starten: https://jpleyer.limesurvey.net/232613?lang=de

oder

scannen Sie den folgenden QR-Code:

Die Umfrage ist ab heute bis zum **31.08.2025, 23:59** Uhr aktiv.

Sollten Ihnen weitere Ärzt:innen bekannt sein, die Vorsorgeuntersuchungen durchführen, freuen wir uns, wenn Sie diese E-Mail entsprechend weiterleiten.

Kontakt: Bei Fragen zur Studie oder technischen Problemen wenden Sie sich gerne an:
jule.pleyer@aihta.at oder +43 (0) 12 36 8119 – 28

AIHTA Website: www.aihta.at

Weitere Informationen zum Projekt finden Sie unter:
https://aihta.at/page/inhaltliche-weiterentwicklung-vorsorgeuntersuchung/de

Wir danken Ihnen herzlich für Ihre wertvolle Zeit und Unterstützung!

Mit herzlichen Grüßen,
Jule Pleyer

Appendix-IV: Example search strategy for Medline via Ovid

Search Name: Ovid MEDLINE(R) ALL <1946 to May 22, 2025>	
Search date: 26.05.2025	
ID	Search
1	exp Life Style/ (118,774)
2	life?style*.mp. (162,848)
3	life-style*.mp. (77,194)
4	physical activity.mp. (173,315)
5	exp Exercise/ (271,952)
6	exercis*.mp. (516,907)
7	exp Alcohol Drinking/ (82,109)
8	exp Alcoholism/ (82,416)
9	(alcohol adj3 (abuse or misuse)).mp. (26,701)
10	nutrition.mp. (315,332)
11	diet*.mp. (970,837)
12	exp Obesity/ (283,705)
13	obes*.mp. (492,935)
14	over?weight.mp. (104,669)
15	over-weight.mp. (597)
16	weight.mp. (1,334,773)
17	exp Movement/ (698,554)
18	movement*.mp. (651,644)
19	physical inactivity.mp. (12,216)
20	exp Sedentary Behavior/ (15,418)
21	sedentary.mp. (49,977)
22	behavio?r chang*.mp. (29,959)
23	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 (4,040,427)
24	exp Counseling/ (50,934)
25	counsel?ing.mp. (159,508)
26	exp "Referral and Consultation"/ (90,893)
27	refer?al*.mp. (212,737)
28	recommend*.mp. (974,573)
29	prescri*.mp. (327,861)
30	consult*.mp. (248,397)
31	advice*.mp. (66,936)
32	(motivational adj3 (enhancement* or technique* or message*)).mp. (1,769)
33	exp Motivational Interviewing/ (2,905)
34	Interview*.mp. (553,563)
35	trained intervention*.mp. (156)
36	coaching*.mp. (12,203)
37	exp Mentoring/ (4,986)
38	exp Patient Education as Topic/ (91,007)
39	education.mp. (1,167,514)
40	exp Behavior Therapy/ (97,543)
41	(behavio?r* adj3 (change or theor*)).mp. (57,122)
42	LsC*.mp. (12,570)

43	24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 (3,240,588)
44	23 and 43 (509,124)
45	((brief or minimal) adj3 (intervention* or advice or counsel* or consult*)).mp. (15,238)
46	SBIRT.mp. (646)
47	(informat* adj3 material*).mp. (5,222)
48	exp Patient Education Handout/ (6,019)
49	computer program*.mp. (14,492)
50	telephone delivery.mp. (70)
51	exp Formative Feedback/ (1,306)
52	goal* planning.mp. (179)
53	45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 (42,507)
54	44 and 54 (5,273)
55	limit 54 to (meta analysis or "systematic review") (284)
56	(((comprehensive* or integrative or systematic*) adj3 (bibliographic* or review* or literature)) or (meta-analy* or metaanaly* or "research synthesis" or ((information or data) adj3 synthesis) or (data adj2 extract*))).ti,ab. or (cinahl or (cochrane adj3 trial*) or embase or medline or psyclit or (psycinfo not "psycinfo database") or pubmed or scopus or "sociological abstracts" or "web of science").ab. or ("cochrane database of systematic reviews" or evidence report technology assessment or evidence report technology assessment summary).jn. or Evidence Report: Technology Assessment*.jn. or ((review adj5 (rationale or evidence or safety or effectiveness)).mp. and review.pt.) or meta-analysis as topic/ or Meta-Analysis.pt. (881,180)
57	54 and 57 (476)
58	55 or 57 (477)
59	limit 58 to yr="2015 – 2025" (334)
60	remove duplicates from 59 (332)
Total hits: 332	

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