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The governance gap in certified cancer centers: organisational autonomy between clinical and corporate governance

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Abstract

Background.

Organisational autonomy is considered a prerequisite for effective management, resource allocation and continuous quality improvement in certified cancer centers. The certification system of the German Cancer Society (Deutsche Krebsgesellschaft, DKG) defines detailed clinical, process and quality requirements but does not prescribe governance structures, and empirical evidence on organisational autonomy in certified centers remains scarce. This study measures organisational autonomy across seven governance dimensions and identifies factors explaining its variability.

Methods.

A standardised cross-sectional online survey was conducted among all DKG-certified Oncological Centers and Comprehensive Cancer Centers registered in the OncoMap database in Germany, Austria and Switzerland (N = 177) between November 2025 and January 2026. A multidimensional autonomy index (0–100) developed for this study operationalised seven dimensions: financial, personnel, IT, organisational, strategic, decision-making and quality management autonomy. Analysis employed non-parametric tests (Friedman, Wilcoxon signed-rank, Mann-Whitney U, Spearman correlations) and hierarchical cluster analysis (Ward linkage, z-standardised dimensions).

Results.

Of 177 eligible centers, 46 participated (response rate 26.0%); after exclusion of the single Austrian respondent the sample comprised 45 centers, of which 43 provided complete autonomy data. The overall autonomy index was M = 68.5 (SD = 12.7; median 71.2; range 38–85). Dimensions varied significantly (Friedman $\chi^2(6) = 98.22$; $p < 0.001$): quality management autonomy was highest (M = 83.3, SD = 14.2), financial autonomy lowest (M = 46.6, SD = 18.0), a difference of 37 index points; the two were essentially uncorrelated ($\rho = -0.06$). University hospitals showed higher financial autonomy than non-university centers (M = 54.1 vs. 43.3; U = 270.0; $p = 0.048$; $d = 0.62$). Monistic and plural leadership models did not differ (all $p > 0.10$). Cluster analysis identified three governance archetypes: high (n = 20), moderate (n = 19) and restricted autonomy (n = 4).

Conclusions.

The findings document a structural governance gap between high quality management autonomy and constrained financial autonomy. Certification effectively drives clinical governance while the resource dimension remains contingent on hospital-level decisions. Maintaining recurring certification

requirements is difficult without corresponding financial autonomy, with implications for the sustainability of certified cancer care and for comparable certified care networks beyond Germany.

Background

Cancer care increasingly relies on multidisciplinary centers that coordinate treatment across surgical, medical and radiation oncology. In Germany, the German Cancer Society (Deutsche Krebsgesellschaft, DKG) has established a certification system that currently encompasses over 1,200 sites across several European countries [1, 2]. This system, integrated into the National Cancer Plan of the Federal Ministry of Health, has produced growing evidence of improved clinical outcomes in certified centers [1, 3, 4, 5].

The DKG system structures cancer care in three hierarchically accumulating tiers, in which each higher tier must fulfil all criteria of the lower tiers [1]. Organ-specific cancer centers represent the foundational tier and focus on a single tumour entity. Oncological Centers (Onkologische Zentren, OZ) form the second tier and function as umbrella organisations that integrate multiple certified organ-specific centers within one hospital, coordinating cross-entity care and consolidating shared structures such as interdisciplinary tumour boards, psycho-oncology and palliative care. Comprehensive Cancer Centers (CCC) form the top tier and are, formally, OZs with additional research responsibilities, exclusively based at university hospitals. The German Cancer Aid (Deutsche Krebshilfe, DKH) provides structural funding to a competitively selected subset of CCCs. While certification defines detailed clinical, process and quality requirements at each tier, it does not prescribe governance structures [1, 7]. Selected requirements across the three tiers are provided in Additional file 2.

Of particular note, certification is voluntary rather than mandated by health regulation. Once attained, however, it imposes recurring obligations: annual surveillance audits and periodic recertification cycles place continuous pressure on centers to maintain documentation, training, infrastructure and personnel qualifications. This recertification dynamic creates a sustained organisational commitment that interacts with governance and resource arrangements.

This study focuses on OZs and CCCs rather than organ-specific cancer centers, because these integrative center types are mandated to coordinate across multiple organ-specific centers and disciplines, making them the relevant unit of analysis for governance questions; organ-specific centers are typically embedded within OZs and share their governance environment.

The absence of prescribed governance structures leads to considerable heterogeneity in how certified centers are governed, ranging from highly formalised leadership structures to historically grown, informal coordination mechanisms [6]. Certified centers are not independent legal entities but organisational units within hospitals, so their governance is shaped by the tension between institutional autonomy and external steering — both by the parent hospital and by the certification body (DKG/OnkoZert).

The importance of governance and organisational autonomy for healthcare organisations is well established in the public management and health services literatures. Verhoest et al. [8] developed the

foundational framework distinguishing financial, managerial, policy, structural and interventional autonomy dimensions for public organisations; Maggetti and Verhoest [9] subsequently called for dimension-specific rather than aggregate measurement approaches. For healthcare specifically, Durán, Saltman and Dubois [10] identified institutional autonomy and accountability as critical success factors for hospital reforms across Europe, while Jalilvand et al. [11] demonstrated the relevance of governance accountability structures in hospitals more broadly.

Yet empirical evidence for the specific context of German cancer centers remains scarce. Existing research has focused primarily on clinical outcomes and guideline adherence [1, 20] and on the effects of certification on long-term survival [3, 4, 5]. The few available governance studies concentrate on Comprehensive Cancer Centers: Brandts [6] analysed organisational requirements of the DKH-funded top centers, while Kehrloesser et al. [7] identified substantial variability in governance quality among 40 European cancer centers accredited by the Organisation of European Cancer Institutes (OECI). For Oncological Centers, the quantitatively largest segment of the certified landscape, systematic governance analyses are absent.

Building on the multidimensional autonomy framework of Verhoest et al. [8] and drawing on the Viable System Model (VSM) as an organisational diagnostic framework [12–15], this study asks: how are governance structures and organisational autonomy distributed across DKG-certified Oncological Centers, and what factors influence their variability? We address this question through a standardised survey of cancer center leadership, operationalising autonomy across seven dimensions specifically adapted for the cancer center context.

Methods

Study design

This cross-sectional observational study is based on a standardised center-level survey. The investigation combines a quantitative survey approach to capture governance structures and autonomy dimensions with a descriptive-exploratory analytical strategy.

Sample and data collection

The study population comprised all DKG-certified Oncological Centers and CCCs in Germany, Austria and Switzerland as registered in the OncoMap database (www.oncomap.de; November 2025: N = 177). Individual organ-specific centers were not included, as the focus was the governance of the umbrella organisation. All centers were invited to participate. Targeted respondents were center coordinators, directors and quality management officers — individuals with knowledge of both operational and strategic governance [16]. Data were collected via a standardised online survey (SurveyMonkey) between November 2025 and January 2026. Center-level rather than staff-level reporting was chosen because the

governance variables of interest (decision rights, formal arrangements, financial structures) require an organisational vantage point.

Survey instrument and autonomy index

The survey instrument was newly developed for this study, adapting the Verhoest et al. [8] autonomy framework to the context of DKG-certified cancer centers (full instrument: Additional file 1, German original and English translation). Seven autonomy dimensions were operationalised — financial, personnel, IT, organisational, strategic, decision-making and quality management (QM) autonomy — and mapped to functional systems of the Viable System Model to enable systems-theoretic interpretation [12–15]. The seven dimensions, their theoretical basis in the Verhoest et al. [8] framework, their VSM mapping and the number of items per dimension are summarised in the supplementary.

All items used a uniform five-point Likert scale (1 = does not apply at all to 5 = fully applies). Four negatively worded items (FIN2, ORG4, STR3, QM3) were included to reduce acquiescence bias [17] and reverse-coded before scale construction. Five dimensions comprised four items each; the financial and IT dimensions comprised five items each in order to capture context-specific aspects that could not be subsumed under the core items. The instrument therefore comprised 30 items in total, all of which enter the dimension scores. Item development combined literature-based deduction with field-based refinement using auditor experience in DKG certification. Before fielding, the draft instrument was pilot-tested by two senior oncologists with in-depth knowledge of cancer center structures; based on their feedback several items were refined and one item on data transfer was removed. Final item selection was informed by item-total correlations and reliability analysis.

Dimension scores were calculated as the mean of item responses within each dimension and transformed to a 0–100 scale (score = ((M − 1)/4) × 100). The overall index was the unweighted mean of the seven dimension scores, equal weighting reflecting their conceptual equivalence. Missing values were handled following established recommendations for exploratory scales [18]: dimension scores required at least 50% of items answered, and the overall index required valid scores on at least five of seven dimensions. The empirical extent of missing data is reported with the sample characteristics below.

Additional survey blocks captured structural variables (center type, ownership, leadership model, follow-up completeness), network governance characteristics and two open-ended questions on enablers and barriers of effective governance.

Statistical analysis

Given the ordinal measurement level and moderate sample size, non-parametric methods were employed throughout. The Friedman test assessed whether autonomy dimensions differed significantly,

followed by pairwise Wilcoxon signed-rank tests. Mann-Whitney U tests compared groups by center type (CCC vs. OZ), ownership (university vs. non-university) and leadership model (monistic vs. plural); effect sizes are reported as Cohen's d. Spearman rank correlations examined associations between autonomy scores and structural variables, including self-reported follow-up completeness. Hierarchical cluster analysis (Ward linkage, z-standardised dimensions) identified governance archetypes, with the optimal cluster solution determined by the elbow criterion and substantive interpretability. Cluster validity was assessed using Kruskal-Wallis tests, silhouette analysis [19], bootstrap replication (1,000 iterations) and leave-one-out stability analysis. Internal consistency was assessed using Cronbach's alpha, interpreted according to Moosbrugger and Kelava [18] (good ≥ 0.70; acceptable 0.60–0.69; limited < 0.60). Open-ended responses were analysed using qualitative content analysis with inductive category formation [21]. All analyses were performed in Python 3.12 (pandas, SciPy, scikit-learn);

Results

Sample characteristics

Of 177 eligible centers, 46 participated (response rate 26.0%). Following exclusion of the single Austrian respondent due to insufficient comparability, the analytical sample comprised 45 centers (Germany: n = 38; Switzerland: n = 5; region not specified: n = 2). For organisational surveys targeting healthcare executives, this response rate is considered acceptable [16]. Complete autonomy data were available for 43 centers (95.6%); the remaining two centers (4.4%) provided no responses to any autonomy items and were excluded from the autonomy analyses by listwise deletion. Among the 43 retained centers there was no relevant item-level missingness.

Regarding center type, the sample included 34 (75,6%) Oncological Centers and 11 (24,4%) Comprehensive Cancer Centers. By ownership, classified following the standard public/private/non-profit framework, 14 centers (31.1%) were public university hospitals and 20 (44.4%) other public (municipal) hospitals; 4 (8.9%) were private non-profit (faith-based or charitable), 4 (8.9%) private for-profit and 3 (6.7%) other. The most common leadership model was monistic (single executive; n = 20, 44.4%), followed by dual (clinical and administrative co-leadership; n = 11, 24.4%) and collegial (shared leadership across three or more persons; n = 6, 13.3%); the remaining centers reported rotating (n = 2), other (n = 4) or no arrangement (n = 2). Respondents were predominantly center coordinators and center directors, confirming appropriate informant selection.

Autonomy dimensions: the governance gap

The overall autonomy index was M = 68.5 (SD = 12.7; median 71.2; range 38–85). Autonomy dimensions differed significantly (Friedman $\chi^2(6) = 98.22$; $p < 0.001$). Quality management autonomy was highest (M = 83.3, SD = 14.2), while financial autonomy was lowest (M = 46.6, SD = 18.0). The 37-point difference between QM and financial autonomy constitutes the central governance gap between clinical and

corporate governance (Table 1; Fig. 1). All pairwise differences between financial autonomy and the other six dimensions were significant (Wilcoxon signed-rank tests, all $p < 0.001$).

Face validity was supported by a significant correlation between the calculated autonomy index and the respondents' global self-assessment of their center's autonomy ($\rho = 0.69$; $p < 0.001$), indicating adequate construct validity of the instrument.

Group comparisons

University hospitals (n = 13) showed significantly higher financial autonomy than non-university centers (n = 30; M = 54.1 vs. 43.3; U = 270.0; $p = 0.048$; Cohen's $d = 0.62$). A trend-level difference favouring university hospitals was observed for QM autonomy (M = 89.4 vs. 80.6; U = 260.0; $p = 0.083$; $d = 0.64$). Non-university centers showed a non-significant tendency toward higher organisational autonomy (M = 75.9 vs. 67.8; U = 141.0; $p = 0.154$), suggesting greater organisational flexibility in smaller institutions. The overall index did not differ significantly between the two groups (M = 70.9 vs. 67.5; U = 228.0; $p = 0.390$). Full results are reported in Table 3.

CCCs showed a clear trend toward higher financial autonomy compared with OZs (M = 55.6 vs. 44.2; U = 218.5; $p = 0.051$; $d = 0.65$). In the sensitivity analysis restricted to German centers (n = 38), this difference reached statistical significance ($p = 0.007$).

Contrary to theoretical expectations, no significant differences were found between monistic (n = 20) and plural (dual/collegial; n = 17) leadership models in either the overall index or the individual dimensions (all $p > 0.10$).

Self-reported follow-up completeness data were available for 28 centers (M = 84.9%, SD = 18.1%). No significant association with the autonomy index was found ($\rho = 0.15$; $p = 0.438$).

Governance typology

Hierarchical cluster analysis identified three distinct governance types (Table 2). Cluster 1 ("high autonomy", n = 20, 47%) exhibited above-average autonomy across all dimensions (M = 79.3), particularly in QM and decision-making autonomy. Cluster 2 ("moderate autonomy", n = 19, 44%) showed intermediate values (M = 62.7) with relative strength in QM but weak financial and decision-making autonomy. Cluster 3 ("restricted autonomy", n = 4, 9%) had low autonomy across most dimensions (M = 42.6), with only QM reaching a moderate level.

The three-cluster solution was validated statistically: the Kruskal-Wallis test confirmed significant differences for the overall index ($H = 34.15$; $p < 0.001$; $\eta^2 = 0.84$). The silhouette coefficient of the three-cluster solution was $S = 0.22$; bootstrap analysis (1,000 replications) yielded a 95% confidence interval of

[0.21; 0.41], and leave-one-out analysis showed a mean adjusted Rand index of 0.85 (SD = 0.21), indicating stable cluster assignment.

CCCs were overrepresented in Cluster 1 and absent from Cluster 3. University hospitals were concentrated in Clusters 1 and 2.

Qualitative findings

Two optional open-ended questions invited respondents to describe, separately, enabling factors and challenges of their center's governance. These were answered by 19 (45%) and 20 (48%) of respondents respectively and were analysed by the first author using qualitative content analysis with inductive category formation [21]. Among enabling factors, interdisciplinary collaboration was named most frequently (n = 7, 37%), followed by short decision pathways and direct access to hospital management (n = 5, 26%) — consistent with the collegial network structures emphasised in the network governance literature [28]. Among challenges, insufficient financial autonomy was the most frequent (n = 7, 35%), exemplified by one respondent's observation that center coordination work generates no dedicated revenue while its operational costs are not compensated. One respondent summarised the situation in three words: there is no autonomy. These qualitative findings corroborate the quantitative results, in particular the financial autonomy bottleneck.

Discussion

The governance gap: clinical versus corporate governance

The central finding of this study is a structural governance gap between high quality management autonomy and constrained financial autonomy in DKG-certified cancer centers. The 37-point difference on the 0–100 index constitutes a meaningful asymmetry between the centers' capacity to shape clinical quality processes and their ability to control the resources necessary for implementation.

This finding aligns with the broader literature on hospital governance. Durán, Saltman and Dubois [10] identify the tension between decision-making capacity and corresponding resources as a fundamental governance dilemma. The present data quantify this tension for the specific context of certified cancer centers for the first time.

The near-zero correlation between QM and financial autonomy ($\rho = -0.06$) underscores this decoupling. DKG certification creates an external framework that successfully promotes clinical governance — consistent with the concept of clinical governance, which anchors responsibility for quality improvement at the operational level — while the corporate governance dimension of resource provision remains unaddressed, echoing the observation by Verhoest et al. [8] that managerial and policy autonomy can develop unevenly across organisational types.

The funding dividend and indirect revenue effects

University hospitals demonstrated significantly higher financial autonomy, reflecting additional revenue streams through research funding, third-party grants and academic partnerships that extend beyond the main financing stream via DRG-based payments. The complementary finding of a non-significant trend toward higher organisational autonomy in non-university centers suggests a trade-off: while university affiliation provides financial advantages, the associated matrix structures involving university administration, medical faculty and research priorities may constrain organisational flexibility. Oberst [22] characterises this as an inherent challenge of CCCs: establishing authoritative leadership structures that integrate research and clinical care proves particularly complex at university hospitals.

The CCC effect on financial autonomy, reaching significance in the German subsample ($p = 0.007$), is consistent with a funding dividend of the DKH structural support: targeted funding for coordination, network infrastructure and translational projects addresses the financial constraint identified as the primary governance bottleneck. That this effect manifests primarily in the financial rather than in other autonomy dimensions is compatible with a direct resource mechanism. The cluster distribution — with CCCs concentrated in the high-autonomy cluster and absent from the restricted cluster — is consistent with DKH funding acting as a protective factor against low autonomy, although the cross-sectional design does not permit causal attribution.

Beyond the explicit DKH mechanism, certification itself generates indirect financial benefits at the hospital level. Kuklinski, Vogel and Geissler [27] showed that for colorectal resections in Germany, patients are willing to travel approximately 9% longer to reach a certified hospital, so certification translates into measurable case-volume effects that compound with the documented outcome advantages of certified care [3, 4, 5]. These benefits accrue to the hospital rather than to the center as an organisational unit, yet they may indirectly inform hospital-level resource decisions for the center — a feedback loop warranting direct investigation linking certification status, demand effects, hospital revenues and center-level resource allocation.

What drives the governance archetypes?

Inspection of cluster profiles indicates which dimensions discriminate most strongly between archetypes (Table 2). Decision-making ($\eta^2 = 0.65$), personnel ($\eta^2 = 0.60$) and strategic autonomy ($\eta^2 = 0.56$) show the largest variance explained by cluster membership, followed by IT ($\eta^2 = 0.50$) and organisational autonomy ($\eta^2 = 0.47$). Financial autonomy contributes at a lower level ($\eta^2 = 0.24$), reflecting that low financial autonomy is a near-universal feature of the sample, varying in magnitude rather than in direction. QM autonomy shows the smallest cluster variation ($\eta^2 = 0.19$) — reinforcing the interpretation that DKG certification stabilises clinical governance capacity even at the lower end of the autonomy spectrum. The archetypes therefore differ primarily in their bundle of operational and strategic decision rights, while clinical governance is comparatively uniform.

Formal structure versus informal mechanisms

The absence of significant autonomy differences between monistic and plural leadership models is a noteworthy null finding. Wolfe et al. [23] reported a comparable result for US NCI-designated cancer

centers, and similar observations on the limited explanatory power of formal board composition exist in the broader hospital governance literature [24]. These converging findings suggest that formal governance structures may matter less than process-related factors — supported by our qualitative data, in which respondents emphasised short decision pathways and direct access to hospital management rather than formal committees. Willcocks [26] reaches a similar conclusion for shared leadership in cancer teams: lived practice rather than formal title appears to determine effective governance.

The governance typology offers a framework for benchmarking and targeted improvement. The high-autonomy cluster (47%) shows that comprehensive governance capacity is achievable within the current system, while the restricted-autonomy cluster (9%) identifies centers constrained across all dimensions except QM. The universal relative strength of QM autonomy across all clusters reinforces the interpretation that DKG certification functions as an effective institutional driver of clinical governance.

Policy implications

These findings carry implications at multiple levels. For the DKG certification system, the results support a cautious, evidence-building approach rather than immediate expansion of requirements. Because this study measures autonomy but does not demonstrate that additional governance criteria improve outcomes, the DKG and policy-makers should consider piloting transparent governance indicators — analogous to the already-published clinical quality indicators — and evaluating whether dedicated coordination funding improves center-level governance capacity, before any governance criteria are made binding.

At the health policy level, the findings point to a systemic financing problem. Center coordination functions — interdisciplinary case conferences, quality assurance documentation, patient navigation and cancer registry reporting — generate value for the entire hospital and the healthcare system but are not adequately reflected in the main financing stream via DRG-based payments.

A partial financing mechanism does formally exist. Under § 136c paragraph 5 of the German Social Code Book V (SGB V), the Federal Joint Committee (Gemeinsamer Bundesausschuss, G-BA) has issued a directive permitting negotiated center surcharges (Zentrumszuschläge) for hospitals fulfilling defined structural and care-coordination criteria [29], and the DKG has published criteria mapping certification against these requirements. The limitation is therefore not a lack of correspondence between the frameworks but the way the mechanism operates in practice: DKG certification does not automatically confer eligibility; where a center is eligible, the surcharge must be negotiated bilaterally between each hospital and the regional sickness funds; and neither its granting nor its magnitude is guaranteed. Field experience indicates that the criteria applied, their interpretation and the negotiated amounts vary across hospitals and federal states, with no published reference benchmarks. As a consequence, the existing mechanism does not provide certified centers with reliable financing and does not systematically counterbalance the certification-driven governance demands.

This mechanism is moreover specific to the German statutory framework and is not transferable to the Swiss or Austrian systems, where DRG-type financing (SwissDRG; the Austrian LKF system) operates without an equivalent center-surcharge provision. While the German Cancer Aid addresses the financing gap for a subset of CCCs through structural funding, the quantitatively larger group of OZs lacks a comparable mechanism. Several options merit evaluation: enabling DKG certification to confer more reliable eligibility for a surcharge; replacing the bilateral negotiation model with published reference amounts based on transparent criteria; or creating a dedicated supplementary funding stream tied to certified-center status, analogous to the DKH model but extended to OZs.

Beyond the specific German context, the DKG system illustrates a broader governance problem of certified clinical networks embedded within larger host organisations: external quality standards may create operational obligations without corresponding devolved resource authority. Whether this pattern recurs in other certified or accredited care networks — such as OECI-accredited centers [25], NCI-designated cancer centers, or specialised stroke and cardiac networks — is an empirically testable question that warrants comparative investigation rather than assumption.

Limitations

Several limitations warrant consideration. First, the sample of 43 centers limits power for subgroup analyses; the restricted-autonomy cluster in particular comprises only four centers, and its profile should be regarded as exploratory. Second, self-reported data are subject to social desirability bias, although the qualitative responses included critical comments; face validity ($\rho = 0.69$) supports construct validity but cannot fully exclude systematic bias, and the center-level perspective excludes staff-level perceptions, an important complementary layer for future work. Third, the cross-sectional design precludes causal inference; all reported relationships are associational. Fourth, the newly developed instrument is a first application without established reference values; while composite reliability was good ($\alpha = 0.89$), dimension-level internal consistency was limited ($\alpha < 0.60$) for four of the seven dimensions (financial, organisational, strategic and QM autonomy; Table 1), so that the corresponding dimension scores should be interpreted with caution. The qualitative analysis by a single analyst is used to contextualise rather than to confirm the quantitative results. Fifth, the five Swiss centers add comparative perspective but limit direct comparability; sensitivity analyses restricted to German centers confirmed that all central findings remained robust.

Future research

Future research should pursue longitudinal designs examining governance trajectories around recertification cycles and transitions between clusters. Qualitative case studies could illuminate the informal mechanisms that appear more consequential than formal structures, and international comparative studies building on the OECI system [25] and NCI designation would contextualise these findings across systems. The instrument should be validated in larger samples and potentially expanded to include objective governance indicators such as budget data, organisational charts and committee protocols. Most critically, the relationship between governance configurations and care quality — not

examined here — deserves investigation with larger samples, objective outcome measures and longitudinal designs.

Conclusions

This study provides the first empirical measurement of organisational autonomy in DKG-certified cancer centers, revealing a structural governance gap between high clinical quality management autonomy and constrained financial autonomy. The DKG certification system effectively promotes clinical governance structures but leaves the corporate governance dimension of resource provision unaddressed. Three distinct governance types — high, moderate and restricted autonomy — were identified, with university affiliation and CCC status associated with higher financial autonomy.

These findings point to concrete, stakeholder-specific implications. Center management can build institutional access to hospital leadership and use the demonstrated strength in quality management as a legitimacy basis for expanded autonomy. Hospital operators should re-examine resource allocation to cancer centers and recognise center coordination as an independent value contribution rather than an unfunded overhead. The DKG could pilot transparent governance indicators alongside its established quality indicators and evaluate them before making any governance criteria binding. At the health policy level, policy-makers should consider whether certification could confer more reliable eligibility for center surcharges, and evaluate published reference amounts or dedicated coordination funding for Oncological Centers. More broadly, the case illustrates a governance problem common to certified clinical networks embedded in larger host organisations: external quality standards can create operational obligations without corresponding devolved resource authority.

Abbreviations

CCC: Comprehensive Cancer Center; DKG: Deutsche Krebsgesellschaft (German Cancer Society); DKH: Deutsche Krebshilfe (German Cancer Aid); DRG: diagnosis-related group; G-BA: Gemeinsamer Bundesausschuss (Federal Joint Committee); LKF: Leistungsorientierte Krankenanstaltenfinanzierung (Austrian performance-oriented hospital financing); NCI: National Cancer Institute; OECI: Organisation of European Cancer Institutes; OZ: Onkologisches Zentrum (Oncological Center); QM: quality management; SGB V: Sozialgesetzbuch V (German Social Legal Book V); STROBE: Strengthening the Reporting of Observational Studies in Epidemiology; VSM: Viable System Model.

Declarations

Ethics approval and consent to participate

Ethics approval was not required for this study, and the study was therefore not submitted to an ethics committee or institutional review board.

The study was conducted at the University of St. Gallen, Switzerland. It falls outside the scope of the Swiss Federal Act on Research Involving Human Beings (Human Research Act, HRA; SR 810.30), which under Article 2(1) covers research concerning human diseases and the structure and function of the human body, including research involving persons, biological material and health-related personal data. No such data or materials were collected and no intervention was performed on any person: the survey asked representatives of certified cancer centers about structural and governance characteristics of their institution, and the unit of analysis is the center. For the German centers, no ethics review is mandated either; in particular, the consultation duty under § 15(1) of the Professional Code of the State Chamber of Physicians of Baden-Württemberg, of which the first author is a member, applies only to research intervening in a person's integrity or using bodily materials or individually attributable data, neither of which applies here.

Participation was voluntary. All respondents were informed on the survey landing page about the purpose of the study, the intended use of the data and the anonymous reporting of results, and provided informed consent by proceeding to the questionnaire. No direct identifiers were collected, and centers are reported anonymously throughout. The study was conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analysed during the current study are not publicly available because individual centres could be re-identified from the combination of structural characteristics reported, and anonymity was guaranteed to participating centres in accordance with the survey design, but are available from the corresponding author on reasonable request in aggregated form. The survey instrument, the dimension specification of the autonomy index and the full analytical documentation are included within the article and its Supplementary.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

MK is a physician at one of the centres in the study population and serves as a DKG certification auditor. This dual role did not influence study design, data analysis or interpretation of results; the participating cancer centres were anonymised and the author was not involved in auditing any of the responding centres during the data collection period. The DKG and OnkoZert had no role in the design of the study, in the collection, analysis or interpretation of data, or in writing the manuscript. AG declares no competing interests.

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Authors' contributions

Author contributions are reported using the Contributor Roles Taxonomy (CRediT). MK: conceptualisation, methodology, software, formal analysis, investigation, data curation, visualisation, writing — original draft, writing — review and editing, project administration. AG: conceptualisation, methodology, validation, writing — review and editing, supervision. Both authors read and approved the final manuscript.

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Use of large language models

During the preparation of this work the authors used Claude (Anthropic) to assist with language editing, structuring and formatting of the manuscript. The tool was not used to generate data, conduct analyses or draw conclusions. Data visualisations (Fig. 1) were generated programmatically from the underlying survey data using standard statistical plotting software. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Tables

Table 1 Descriptive statistics of the autonomy dimensions (n = 43)

Dimension	M	SD	Median	Min	Max	α
Financial autonomy	46.6	18.0	45.0	0	80	0.48
Personnel autonomy	68.5	20.1	75.0	25	100	0.74
IT autonomy	71.7	18.3	75.0	20	95	0.81
Organisational autonomy	73.4	18.0	75.0	25	100	0.51
Strategic autonomy	65.3	15.5	62.5	31	94	0.44
Decision-making autonomy	71.0	18.5	75.0	33	100	0.66
QM autonomy	83.3	14.2	87.5	50	100	0.33
Overall index	**68.5**	**12.7**	**71.2**	**38**	**85**	**0.89**

Friedman test: $\chi^2(6) = 98.22$, $p < 0.001$. M mean, SD standard deviation, α Cronbach's alpha (composite α of 0.89 across all 30 items). Reliability interpretation per Moosbrugger and Kelava [18]: good ≥ 0.70;

acceptable 0.60–0.69; limited < 0.60. QM quality management.

Table 2 Cluster profiles of the governance types (n = 43)

Dimension	Cluster 1 M (n = 20)	SD	Cluster 2 M (n = 19)	SD	Cluster 3 M (n = 4)	SD
Financial	55.2	18.8	41.2	11.5	28.8	20.2
Personnel	82.8	13.4	60.9	13.0	32.8	9.4
IT	83.2	7.5	66.1	18.1	41.2	6.3
Organisational	83.1	13.3	70.2	13.4	40.6	14.9
Strategic	75.0	10.7	61.2	10.9	35.9	6.0
Decision-making	86.2	11.6	60.4	11.3	45.3	6.0
QM	89.7	11.2	78.6	14.6	73.4	13.9
Overall	**79.3**	**3.3**	**62.7**	**6.8**	**42.6**	**3.9**

Cluster 1 "high autonomy"; Cluster 2 "moderate autonomy"; Cluster 3 "restricted autonomy". Overall index: Kruskal-Wallis H = 34.15, p < 0.001, η² = 0.84. Silhouette coefficient S = 0.22; bootstrap 95% CI [0.21; 0.41]. QM quality management.

Table 3 Autonomy by ownership: university versus non-university centers (n = 43)

Dimension	University M (SD)	Non-university M (SD)	U	p
Financial	54.1 (21.6)	43.3 (15.5)	270.0	0.048
Personnel	69.7 (16.9)	67.9 (21.6)	202.0	0.863
IT	76.9 (18.5)	69.5 (18.1)	255.0	0.113
Organisational	67.8 (20.1)	75.9 (16.8)	141.0	0.154
Strategic	66.8 (17.6)	64.6 (14.8)	206.5	0.769
Decision-making	71.3 (19.5)	70.9 (18.4)	203.0	0.842
QM	89.4 (12.6)	80.6 (14.2)	260.0	0.083
Overall	**70.9 (13.4)**	**67.5 (12.5)**	**228.0**	**0.390**

University n = 13; non-university n = 30. Mann-Whitney U test, two-sided. Financial autonomy: Cohen's d = 0.62; QM autonomy: d = 0.64. QM quality management.

Figures

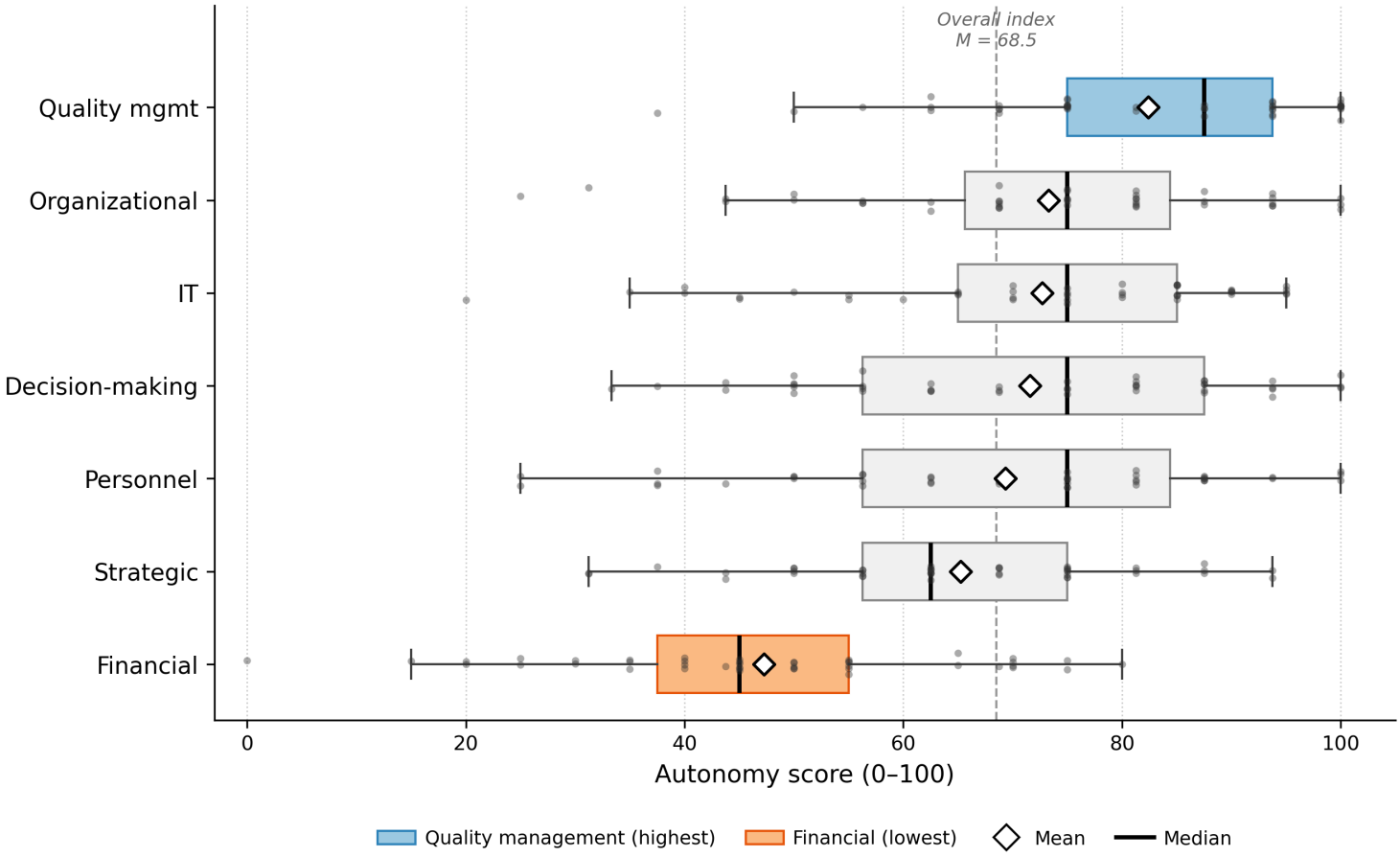


Figure 1

Distribution of autonomy scores across the seven dimensions of the autonomy index

Autonomy scores for n = 43 centers, ordered by mean from highest (top) to lowest (bottom). Boxes show the median (vertical line) and interquartile range; whiskers extend to 1.5 × IQR; white diamonds mark the dimension mean; points show individual centers. The dashed line indicates the overall autonomy index (M = 68.5). The figure illustrates the central governance gap: quality management autonomy (top; median 87.5) clusters at the upper end of the scale with limited variability, whereas financial autonomy (bottom; median 45.0) clusters at the lower end — a difference of 37 points between the highest and lowest dimension means. Dimension medians, minima and maxima correspond to Table 1.

Supplementary Files

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