Original Research Article

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Perception of the role of Telemedicine in Interstitial Lung Diseases: Findings from Società Italiana di Pneumologia/ Italian Respiratory Society (SIP-IRS) survey

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ABSTRACT

Background: Telemedicine (TM) is increasingly recognised as a valuable tool in the management of interstitial lung diseases (ILDs). Despite its potential, its integration and application still remain limited. Our work aimed to assess pulmonologists' (physicians and trainees) perception regarding the use of TM in ILDs management.

Methods: This national survey was created and distributed to all pulmonologists, both physicians and trainees, affiliated with Società Italiana di Pneumologia/Italian Respiratory Society (SIP/IRS). Responses were collected anonymously and analysed by using descriptive statistical analysis and the chi-square test.

Results: Among 2,906 invited participants, 44 completed the survey. While 95.5% of respondents considered TM useful in ILDs monitoring, only 36% reported its use in clinical practice. Current barriers included reduced availability of TM services (64%) and limited knowledge of TM software (56.8%). Moreover, the majority of participants referred a supportive but not substitutive role of TM in-person consultations, especially in monitoring and patient education. A significant proportion of repliers (over 50%) claimed that it may reduce waiting lists and enhance patient satisfaction (63.6%). However, concerns regarding data security and absence of standardised protocols were also reported.

Conclusions: TM is positively perceived by both physicians and trainees' pulmonologist for ILDs follow-up and educational purposes in ILD management. Nevertheless, its integration and application are still hindered by some concerns such as limited infrastructure and digital literacy as well as lack of standardisation of reimbursement protocols and evolving regulatory frameworks. Broader integration of TM will require to address these challenges through investments in technology, structured protocols, and training initiatives.

Key words: telemedicine, interstitial lung diseases, medical settings, ILD management

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Background

Telemedicine (TM) is a field of medicine that employs technology to facilitate provision of healthcare services to patients in remote setting [1]. In the last few years, TM has been increasingly applied to various diseases for different purposes, such as grading of diabetic retinopathy, skin lesions differentiation, home monitoring of idiopathic pulmonary fibrosis (IPF) and chronic obstructive pulmonary disease (COPD) patients, showing a potential in predicting mortality [2]. Amid fibrotic interstitial lung diseases (f-ILDs), IPF is the most common form whose hallmark is the radiological or histopathological pattern of usual interstitial pneumonia, observed on high-resolution computed tomography of the chest or lung biopsy, respectively [3]. Despite the availability of nintedanib as antifibrotic therapy in f-ILDs treatment, these forms are characterised by variable overall survival and poor quality of life (QoL) [4,5]. In this context, TM is a versatile and highly valuable tool that may bring significant advancements in the management and follow-up of ILD patients [6]. Additionally, home and remote monitoring, clinical trials, pulmonary rehabilitation, and psychological support for ILD patients remain challenging areas where TM might help bridge the existing gap in care [7]. Therefore, this survey, proposed and conducted by ILD Study Group of the Società Italiana di Pneumologia/Italian Respiratory Society (SIP/IRS), aims to assess pulmonologists' (physicians and trainees) perception of TM use in the field of ILDs.

Materials and methods

Survey diffusion and data collection

The survey was proposed and distributed to all physicians affiliated with SIP-IRS via Society's online newsletter in April 2024 and remained available until June 2024. The questionnaire was accessible on the SIP-IRS website, and regular reminders were sent via email to encourage completion, as documented in the weekly newsletter of the society. Before accessing the online questionnaire, respondents were explicitly asked for consent to participate. Submitted answers were recorded through an online SIP/IRS platform and checked for duplicates. All data were subsequently included in an electronic database that guaranteed the anonymity of

every participant. The complete questionnaire and all associated responses are presented in Table 1.

Statistical analysis

Data were collected in an electronic database, thereby ensuring the anonymity of each participant. A descriptive statistical analysis was conducted using Jamovi (GNU General Public License, version 2.4.8.0). Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were expressed as frequencies and percentages. The chi-square test (χ^2) was employed to investigate and identify any differences between the categorical variables. A p-value < 0.05 was deemed statistically significant.

Results

Characteristics of the participants

Among 2,906 physicians who received the newsletter, 44 medical doctors (mean age ± SD: 36.5 ± 10.8 years) completed the survey. The majority of participants were 25 pulmonologists (56.8%), followed by 18 residents in pulmonology (40.9%), and 1 immunologist (2.3%). Thirty-eight participants (86.4%) were employed at university hospitals (UH), while the remaining 6 (13.6%) reported the following affiliations: 3 at non-university hospitals (n-UH) and 3 at outpatient clinics.

Among the participants, 16 (36.3%) and 9 (20.4%) reported working in centres that treat more than 250 and 150–250 ILD patients per year, respectively. Thus, all of these participants confirmed that their centres were authorized to prescribe antifibrotic drugs. On the other hand, the remaining physicians reported working in centers that treat between 50-150 ILD patients per year or fewer than 50 patients per year (11.3%). Additionally, 91% of participants reported that antifibrotic treatment was regularly prescribed at their centre, while only four centres were unable to do so. A statistically significant association was found between the participants' medical setting and the number of ILD patients followed by a specific centre (p = 0.01), as well as between the number of ILD patients and the prescription of antifibrotic drugs (p = 0.03).

Medical doctors' position on TM use in ILD

On this topic, we observed a favourable opinion toward the application of TM in ILDs. The responses revealed that 42 participants (95.5%) stated that TM might be useful in ILD monitoring, while only 2 (4.5%) gave a negative response. No significant differences were found between TM usage and the total number of patients followed by a given centre (p = 0.5), nor when comparing data from UH, n-UH and outpatient clinics (p = 0.1).

Ongoing use of TM in medical settings

Although most responses indicated substantial consensus regarding the implementation of TM in ILD clinical routine, its practical application remains limited across all medical settings (UH, n-UH and outpatient clinics). Twenty-eight participants (64%) reported that TM consultations were unavailable in their setting, while 16 participants (36%) confirmed routine TM use in clinical practice. A statistically significant association was found between the average number of patients followed in a specific centre and the routine application of TM (p < 0.001). In this context, five participants (55.6%) followed 10–25 ILD patients via TM, three (33.3%) followed 25–50 patients, and one (11.1%) fewer than 10 patients.

Limited application of TM is further reflected in participants' knowledge: 25 (56.8%) were unaware of any TM software, 11 (25%) were familiar with one software program, while five (11.4%) and three (6.8%) reported using two and more than three software programmes, respectively. Overall, a statistically significant association was observed between TM software knowledge and medical setting (UH, n-UH, and outpatient clinics) (p = 0.004); however, no significant association existed between software availability/awareness and the number of cases treated in a centre (p = 0.55).

Table 1. Survey's questionnaire.

Items	Answers (n=44)	%
Q1: How many patients do you visit in your ILD outpatient clinic every year?		
> 250	16	36.3%
150–250	9	20.4%
50–150	14	31.8%
>50	5	11.3%
Q2: Was your pulmonology unit authorized to prescribe antifibrotic drugs?		
1. No	4	9.1%
2. Yes	40	91%
Q3: Do you support that TM may have a useful role in the monitoring of ILD patients?		
1. No	2	4.5%
2. Yes	42	94.5%
Q4: Can patients at your ILD outpatient clinic have remote consultations by TM?		
1. No	28	64%
2. Yes	16	36%
Q5: If yes, how many ILD patients are followed by TM?		
1. < 10	3	33%
2. 10–25	2	22%
3. 25–50	4	44%
Q6: How many TM software do you know?		
1. 0	25	57%
2. 1	11	25%
3. 2	5	11%
4. > 3	3	6.8%
Q7: Does TM provide an effective method for monitoring ILD patients, or should outpatient visits continue to be monitored in presence?		
1. I believe telemedicine can provide closer monitoring		26 (59.1%)
2. I believe that telemedicine cannot be useful in monitoring patients		3 (6.8%)
3. I believe that telemedicine can partially guarantee close monitoring		15 (34.1%)
Q8: As far as you concern, the management of ILD patients by TM:		
1. Improved the patients' satisfaction rate regarding the clinic and therapeutic follow-up		28 (63.6%)
2. Improved the patients' satisfaction rate only regarding the clinical follow-up		10 (22.7%)
3. Improved the patients' satisfaction rate regarding treatment monitoring		6 (13.6%)
Q9: Can a patient with ILD who is taking antifibrotic be followed at home via telemedicine?		
1. No	41	93.2%
2. Yes	3	6.8%
Q10: How often should an ILD patient under antifibrotic treatment be seen via TM?		
1. I don't follow-up ILD patients with TM	2	4.5%
2. Every month	10	23%
3. Every 2 months	9	20%

Items	Answers (n=44)	%
4. Every 3 months	16	36%
5. Every 4 months	7	16%
Q11: In your opinion, which of the following role(s) would be most appropriate in the use of TM in patients with ILD?		
1. Therapeutic adherence		6 (13.6%)
2. Educational		16 (36.3%)
3. Clinical monitoring		2 (4.5%)
4. Psychological support		2 (4.5%)
5. All previous		18 (40.9%)
Q12: Which of the following processes do you think could benefit from the use of TM?		
1. Daily reminders on the correct use of monitoring devices (via e-mail, via app, etc.)		19 (43.2%)
2. Support and tutorials for patients (use of the spirometer, psychological support, etc.)		23 (52.3%)
3. I disagree with the application of TM to these processes		2 (4.5%)
Q13: It would be more useful for TM to focus on:		
1. Monitoring patients		19 (43.2%)
2. Promoting patients' awareness		8 (18.2%)
3. Psychological support for patients		8 (18.2%)
4. Educate patients on the use of follow-up monitoring devices		7 (15.9%)
5. Telerehabilitation		2 (4.5%)
Q14: To what extent do you believe that telemedicine can be an effective means of enhancing family support for patients with ILD?		
1. No		2 (4.5%)
2. Yes		35 (79.5%)
3. I don't know		7 (16%)
Q15: In your experience, do you think that remote visits could reduce waiting lists?		
1. No		8 (18%)
2. Yes		23 (52%)
3. I have no experience		13 (30%)
Q16: If telemedicine becomes standard in the near future, do you think it could totally replace outpatient face-to-face visits?		
1. No		35 (80%)
2. Yes		2 (4.5%)
3. Yes, but only if explicitly requested by the patient or if the clinical picture worsens.		7 (16%)
Q17: If yes, what will the frequency of appointments be?		
1. Monthly		1 (50%)
2. Every 2 months		1 (50%)

Table 1 (*Continued*)

Items	Answers (n=44)	%
Q18: Would you prefer a TM tool that:		
1. Allow only patient monitoring		2 (4.5%)
2. Allows the patient monitoring and provides opportunity to intervene		38 (86.3%)
3. I would prefer to see the patient in person rather than via TM		4 (9.1%)
Q19: In terms of leakage and loss of sensitive data, how risky do you think TM can be?		
1. The risk exists, but there are benefits that make the risk negligible		28 (63.6%)
2. The risk is very high		5 (11.4%)
3. The risk is almost zero		11 (25%)
Q20: In general, do you think that TM can increase and improve the quality of patient care?		
1. Yes		2 (4.5%)
2. No		8 (18%)
3. I don't know		34 (77%)

TM usage in ILD follow-up

Although participants widely recognised TM as an effective method for monitoring patients with ILDs, the complete replacement of on-site visits remains a matter of debate. In this context, 26 respondents (59%) stated that TM could enable closer monitoring of ILD patients. In contrast, 15 individuals (34.1%) indicated that TM can only partially ensure tighter monitoring, whereas three participants (6.8%) claimed that TM might not be useful for ILD follow-up. Over 50% of respondents also noted that the utilisation of TM may reduce waiting lists. However, a total of 13 (30%) and 8 (18%) participants expressed reservations regarding this potential benefit.

TM and face-to-face visits

Although a good consensus has been achieved regarding the supportive role of TM in managing waiting lists, it is still far from being considered a gold standard in medical practice. Thirty-five participants (80%) stated that TM should not be used to completely replace in-person consultations, regardless of the number of ILD patients followed at the centres ($p = 0.5$) or type of work setting ($p = 0.9$). Conversely, the remaining respondents suggested that TM could fully replace face-to-face visits either entirely (4.5%) or only if explicitly requested by the patient or in cases of clinical deterioration (16%). Moreover, those who supported a complete replacement of in-person consultations (4.5%) also proposed scheduling remote visits on a monthly or bimonthly basis.

Thus, twenty-eight medical doctors (63.6%) reported that the application of TM in ILD management may enhance patient satisfaction by supporting both clinical and therapeutic follow-up. Ten respondents (22.7%) recommended its use exclusively for clinical follow-up purposes, while the remaining six participants (13.6%) agreed with the use of TM to enhance patient satisfaction specifically in the context of antifibrotic treatment monitoring.

Time points of TM consultation

Regarding the optimal frequency of telemonitoring for patients with ILD receiving antifibrotic therapy, the majority of respondents (36%) indicated a three-month interval as the preferred schedule. This was followed by 10 respondents (23%) suggesting monthly follow-up, 9 (20%) recommending follow-up every two months, and 7 (16%) opting for a four-month interval. Only 2 respondents (4.5%) reported not using telemonitoring for ILD management. Nonetheless, a broad consensus emerged, with over 90% of respondents indicating that antifibrotic drugs cannot be managed solely via telehealth.

TM insights in ILD

Due to its versatility, TM may be applicable across a wide range of domains in the management of ILDs. In this survey, 18 participants (40.9%) indicated that TM could be beneficial in several aspects of ILD care such as patient education, support for therapeutic adherence, psychological assistance, and clinical monitoring. Specifically, 16 respondents (36.3%) emphasized the potential educational value of TM, while 6 (13.6%) proposed its use to enhance adherence to antifibrotic therapies. Clinical monitoring and psychological support were each identified by 2 participants (4.5%) as suitable areas for TM integration. Regarding the primary application of TM, nineteen individuals (43.2%) identified clinical monitoring as the main focus area. This was followed by initiatives aimed at enhancing patients' awareness (18.2%), providing psychological support (18.2%), and patient education on the use of follow-up monitoring devices (15.9%). Only two subjects (4.5%) considered TM a suitable modality for delivering telerehabilitation.

Hypothetical risks and benefit of TM implementation in ILD setting

Over 85% of respondents confirmed that TM may facilitate patient monitoring and provide opportunities for timely intervention. Four participants (9.1%) supported the use of TM solely for follow-up, whereas two (4.5%) preferred traditional face-to-face visits. Furthermore, 25% and 63.6% of participants underlined that the risk of sensitive data leakage is minimal or negligible, respectively, thereby reinforcing the perceived safety of the TM application. Low or absent risk of data breaches (i.e., hacking, unauthorised access) or data loss/exposure was associated with the medical setting ($p = 0.04$) but not with the number of patients managed by the centres ($p = 0.08$). Additionally, support for caregivers and relatives of ILD patients was widely recognised as a critical area by respondents in this survey. Specifically, 79.5% of participants agreed on the implementation of teleconsultation services aimed at delivering psychological support to family members or caregivers of ILD patients. This underscores the importance of addressing psychological needs to develop tailored disease management within the TM framework. Finally, a degree of uncertainty remains, with 77% of respondents expressing reservations regarding TM's capacity to improve the overall quality of patient care.

Discussion

In recent years, there has been a progressive enhancement of TM within healthcare facilities. The COVID-19 pandemic has significantly boosted the adoption and applicability of TM; in response to social distancing measures, TM has shown promising results in a wide array of health issues such as the collection of clinical data and vital parameters, provision of assistance and consultation, psychological support, and rehabilitation programmes. In addition, it has contributed to reducing hospitalisation and enhancing the quality and continuity of therapeutic interventions [8,9,10]. Amid chronic diseases, ILDs are characterized by complex clinical management and a variable course requiring individualised and periodic patient assessments. This increased need for closer monitoring has prompted TM use to track the clinical course of ILDs [11]. In 2020, Moore et al. conducted the first Randomised Controlled Trial (RCT) on ninety IPF patients followed through an eHealth approach. They demonstrated that integrating home-monitoring with the standard of care resulted in significant improvements in both psychological and general well-being after 24 weeks [12]. In a separate RCT on 306 patients affected by heart failure, COPD, and ILDs, Bekelman et al. highlighted that a telecare system involving nurses and social workers improved QoL compared with the standard care group [13]. Despite these promising results, the integration of TM in clinical practice is still in its early stages. Cost-effectiveness concerns, adequate technological infrastructure, lack of appropriate training for healthcare providers, issues related to patient engagement and adherence as well as the absence of structured reimbursement mechanisms for both clinicians and patients' medical devices still represent major barriers to the widespread implementation of TM across healthcare settings (UHs, n-UHs, and outpatient clinics) [7, 14].

Within the broader context of cost-effectiveness, face-to-face visits remain the gold standard in clinical practice and ILD monitoring, as confirmed by our survey, despite requiring significant medical resources and logistical support. This was also highlighted by Grant Orser et al., who performed a prospective study on fifty patients diagnosed with ILDs. The authors showed that patients preferred in-person consultations over teleconsultations [15]. Nevertheless, remote consultations have demonstrated cost-saving potential in various settings, including medical consultations (e.g., orthopaedic check-ups and inflammatory bowel disease monitoring), screening programmes (e.g., diabetic retinopathy), nutritional interventions, and triage evaluations [16-20]. However, heightened social disparities among patients from different socio-economic backgrounds present limitations that underscore a crucial dichotomy: data from our survey and current literature suggest a balance between the need to integrate TM into medical practice to improve cost-effectiveness and the need to preserve the physician-patient relationship.

Interestingly, our work suggested that TM could reduce the length of waiting lists and improve patient satisfaction rates in ILD care. In this context, Pfeil et al. performed a retrospective study on over 100,000 patients showing that TM via e-consultations, standardised referral protocols, and high-risk patient identification can effectively reduce waiting lists and consultation times [21]. Recently, Gleen et al. conducted a pilot study on fifty ILD patients using a smartphone application for disease monitoring and data collection. High user engagement and active utilisation of the app's functionalities were reported by participants [22]. Nonetheless, limited digital literacy and difficulties in using digital devices still remain crucial limitations to the adoption of TM in clinical practice [7].

Furthermore, ensuring adequate digital infrastructure and proper training for both healthcare professionals and ILD patients are still significant challenges that may ultimately delay the integration of TM. In this scenario, the availability of infrastructure and tools for implementing TM is marked by significant geographical and regulatory heterogeneity [23]. Accordingly, our survey highlighted some key issues such as the reduced availability of TM services in hospitals, limited familiarity with relevant software, and high scepticism about its impact on quality of care. These findings reflect the limited and heterogeneous use of TM in Italy, likely influenced by an evolving regulatory framework.

As of now, the field of ILDs is undergoing continuous evolution. Althobiani et al. conducted a survey exploring clinicians' perspectives on the application of TM in ILD management. The results showed that clinicians supported the use of TM for monitoring symptoms, disease progression, therapeutic interventions, QoL, and for reducing in-person consultations [6]. Similarly, in our study, the majority of respondents indicated that TM may be an appropriate tool to assess therapeutic adherence, provide psychological support, offer educational benefits, and facilitate clinical monitoring. Specifically, over 85% of respondents agreed that it could be an effective tool for monitoring ILD patients and, when necessary, enabling more frequent follow-up. These findings are consistent with those reported by Russell et al., who conducted a prospective study involving fifty IPF patients followed at home for three years using handheld spirometry, following adequate training on device use. The assessment of forced vital capacity through home-based spirometry proved informative in predicting disease progression. In another study, Edwards et al. monitored patients with pulmonary fibrosis using home spirometry and the patient "Mpower app" after video-based training. Patients gave positive feedback on its use and benefits for daily life and well-being [24]. Current literature recommends both educational support (e.g., tutorials, guidance) and ongoing encouragement via daily reminders to support monitoring through devices such as continuous oximetry or home spirometry, as well as clinical data such as monitoring of patient-reported outcomes/QoL scores, acute exacerbation, hospitalisation risk, and QoL decline have also been recommended. Regarding psychological support, it may be delivered through dedicated tele-psychology sessions, online cognitive-behavioural therapy programmes and webinars or tutorials that aim to provide stress management and coping strategies as well as forums and support groups managed by licensed mental health professionals. Despite these data suggesting increasing

patient awareness and acceptance regarding a future TM role in ILD monitoring, the lack of standardised protocols and the need for further confirmation in prospective studies and RCTs still limit its use to a select group of patients.

Another crucial issue is the lack of support for its use in antifibrotic treatment monitoring and the absence of standardised follow-up schedules for therapeutic evaluation. In 2024, Aggarwal et al. proposed the first RCT using a hybrid approach combining in-person and remote visits focused on patients with myositis-associated ILDs treated with nintedanib as an antifibrotic agent. The study aimed to evaluate the effects of this treatment on disease progression, QoL, and symptoms [25]. This novel RCT design may represent a noteworthy milestone, potentially influencing future strategies for antifibrotic therapy management and paving the way for wider integration of TM in ILD-related trials. Nevertheless, the limited use of TM for antifibrotic treatment monitoring may be due to the narrow therapeutic index of these drugs and the risk of side effects in ILD patients. These include gastrointestinal symptoms such as diarrhoea, nausea, vomiting and, more rarely, bleeding and cardiovascular events, which may present variably among patients [26, 27]. Therefore, the high variability in drug side effects may explain the heterogeneous follow-up schedules, as reflected in our survey, for individuals with ILDs undergoing antifibrotic treatment.

Thus, one of the most crucial concerns in TM use is the security of sensitive data. Although our work reported positive feedback, indicating that this risk could be outweighed by the benefits, it still remains a key issue that slows down TM integration into clinical practice. As healthcare services increasingly rely on digital platforms for remote consultations, data transmission and electronic health record storage, the maintenance of data privacy and protection is a crucial prerequisite for TM usage [28, 29]. In 2018, the approval of the European Union General Data Protection Regulation (EU-GDPR) marked a turning point, leading to stricter rules regarding informed consent, obligation to notify, appointment of data protection officers, and harsher penalties [30]. Despite the introduction of EU-GDPR as well as improvements in secure networks and protocols, a risk of sensitive data breach (i.e., hacking, unauthorised access) or data loss/exposure exists due to human errors, outdated software or insufficient cybersecurity measures. In parallel, ethical regulatory aspects such as obtaining informed consent, data minimisation and anonymisation need to be ensured. Therefore, it is crucial for healthcare providers to monitor their digital infrastructures, invest in up-to-date and advanced technologies and provide adequate training to minimise these risks and to support TM growth by increasing patients' trust in TM services (Figure 1).

This study has several limitations. First of all, the limited sample size can affect statistical power, reduce the precision of estimates, and generalisability of the findings. Furthermore, most respondents came from a UH setting, introducing a potential selection bias. The small sample size, along with younger mean age, may represent a source of bias; they may not accurately represent the broader target population and might reflect specific characteristics associated with an academic context, thus limiting the external validity of the results. Additionally, recruitment through a professional society newsletter may have introduced a self-selection bias, likely favouring individuals who are already positively predisposed towards TM. Therefore, this voluntary form of participation may skew the sample towards more engaged or supportive respondents, potentially leading to an overestimation of acceptance, familiarity or satisfaction levels with TM use. Finally, a further crucial limitation is the composition of respondents, who are predominantly pulmonologists (physicians and trainees). This may introduce additional selection bias by limiting the generalisability of the findings to other healthcare professionals involved in ILDs management.

Conclusions

Our survey highlighted a positive attitude towards the use of TM in ILDs management, particularly for clinical monitoring, patient education and support. Although TM integration into clinical practice may provide several benefits such as reducing waiting lists, enhancing patient satisfaction rates and supporting in person consultations, it is still perceived

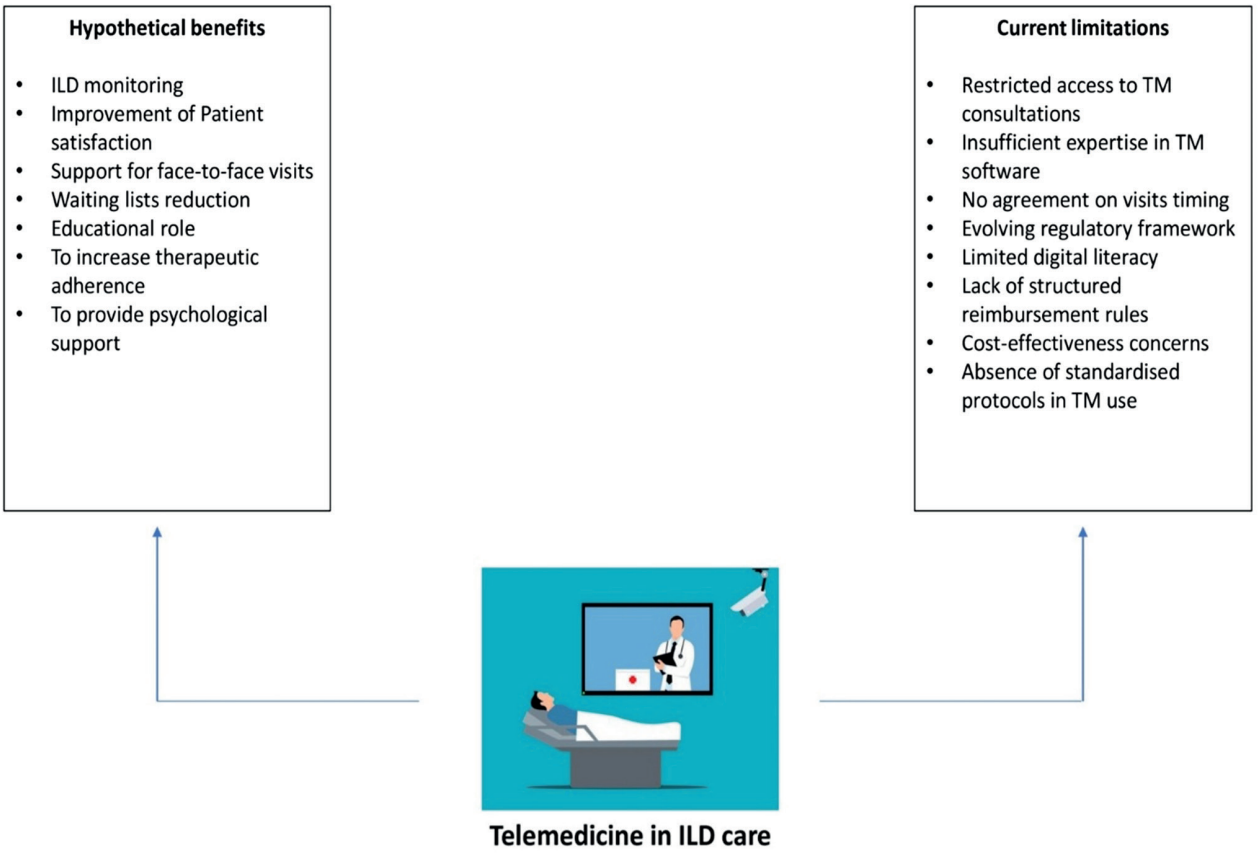

Figure 1. The role of Telemedicine in interstitial lung diseases' care. This figure shows how the integration of TM into the management of ILDs may offer several hypothetical benefits, including improved disease monitoring, enhanced patient satisfaction, reduced waiting times, support for in-person visits, psychological assistance, increased adherence to antifibrotic therapies, and a stronger educational role. However, its widespread implementation is still limited by several barriers, such as restricted access to TM services and digital resources, limited digital literacy, insufficient expertise in telemedicine platforms, lack of consensus on visit scheduling, absence of standardized protocols, unstructured reimbursement systems, and an evolving regulatory landscape. Abbreviations: ILDs, interstitial lung diseases; TM, telemedicine.

as a complementary tool. To date, its implementation remains limited due to inadequate technology infrastructure, low familiarity with softwares, insufficient digital literacy and the lack of standardised protocols and reimbursements mechanisms. Data security is also still a key concern that requires secure digital infrastructures, adequate training for both providers and users as well as appropriate regulatory frameworks to enable its wider application in routine clinical practice. All in all, TM represents a promising tool to enhance ILD care, but its full integration in routine care depends on addressing these current limitations. Further studies are warranted to explore effective strategies and protocols to overcome these challenges and to facilitate TM integration into routine ILD management.

List of abbreviations

TM: Telemedicine
ILDs: Interstitial lung diseases
UH: University hospital
n-UH: Non-university hospital
IPF: Idiopathic pulmonary fibrosis
COPD: Chronic obstructive pulmonary disease
F-ILD: Fibrotic-interstitial lung disease
SIP/IRS: Società Italiana di Pneumologia/Italian Respiratory Society

SpO_2: Pulse-oximetric oxygen saturation
SD: Standard deviation
QoL: Quality of life
EU-GDPR: European Union General Data Protection Regulation
RCT: Randomised Controlled Trial

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