

EVALUATION OF GOOGLE FORMS USAGE FOR APPLYING THE OSWESTRY DISABILITY INDEX IN PATIENTS UNDERGOING SPINE SURGERY

AValiação do uso do Google Forms para aplicação da escala de Oswestry em pacientes submetidos à cirurgia de coluna

Evaluación del uso de Google Forms para la aplicación de la escala de Oswestry en pacientes sometidos a cirugía de columna

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ABSTRACT

Objective: To evaluate the feasibility and effectiveness of using Google Forms for longitudinal application of the Oswestry Disability Index (ODI) in patients undergoing spine surgery. **Methods:** Retrospective observational study conducted at a specialized orthopedic clinic in Belo Horizonte, Brazil, between 2021 and 2023. Patients undergoing spine surgery (n=402) were invited to complete the ODI via Google Forms preoperatively and at 30, 90, 180, and 360 days postoperatively. The clinic secretary made telephone contact and sent the form link via email. Response rates were analyzed over time, by sex, age group, and year of inclusion. **Results:** Response rates were 100% preoperatively and at 30 days, 93.8% at 90 days, 84.6% at 180 days, and 62.4% at 360 days. Patients aged 41-60 years showed the most consistent response rates. Women demonstrated slightly higher adherence in longer periods (64.9% vs 59.3% at 360 days). Patients included in 2021 and 2022 maintained response rates above 98% after one year. **Conclusion:** The use of Google Forms for longitudinal ODI application in spine surgery proved to be feasible and effective, with high response rates, especially in initial follow-up periods. This approach offers a promising alternative to traditional data collection methods, potentially improving the efficiency of postoperative follow-up in spine surgery. **Level of Evidence IV; retrospective observational study.**

Keywords: Spine; Surgery; Surveys and Questionnaires; Longitudinal Studies; Electronic data collection.

RESUMO

Objetivo: Avaliar a viabilidade e eficácia do uso do Google Forms para a aplicação longitudinal do Índice de Incapacidade de Oswestry (ODI) em pacientes submetidos à cirurgia de coluna. **Métodos:** Estudo retrospectivo observacional conduzido em uma clínica ortopédica especializada em Belo Horizonte, Brasil, entre 2021 e 2023. Pacientes submetidos à cirurgia de coluna (n=402) foram convidados a preencher o ODI via Google Forms no pré-operatório e aos 30, 90, 180 e 360 dias pós-operatórios. A secretária da clínica realizava contato telefônico e enviava o link do formulário por e-mail. Foram analisadas as taxas de resposta ao longo do tempo, por sexo, faixa etária e ano de inclusão. **Resultados:** As taxas de resposta foram de 100% no pré-operatório e 30 dias, 93,8% aos 90 dias, 84,6% aos 180 dias e 62,4% aos 360 dias. Pacientes entre 41-60 anos apresentaram as maiores taxas de resposta consistentes. Mulheres demonstraram uma adesão ligeiramente superior nos períodos mais longos (64,9% vs 59,3% em 360 dias). Pacientes incluídos em 2021 e 2022 mantiveram taxas de resposta superiores a 98% após um ano. **Conclusão:** O uso do Google Forms para aplicação longitudinal do ODI em cirurgia de coluna mostrou-se viável e eficaz, com altas taxas de resposta, especialmente nos períodos iniciais de seguimento. Esta abordagem oferece uma alternativa promissora aos métodos tradicionais de coleta de dados, potencialmente melhorando a eficiência do acompanhamento pós-operatório em cirurgia de coluna. **Nível de Evidência IV; estudo observacional retrospectivo.**

Descritores: Coluna Vertebral; Cirurgia; Inquéritos e Questionários; Pesquisa longitudinal; Coleta de dados eletrônica.

RESUMEN

Objetivo: Evaluar la viabilidad y eficacia del uso de Google Forms para la aplicación longitudinal del Índice de Discapacidad de Oswestry (ODI) en pacientes sometidos a cirugía de columna. **Métodos:** Estudio retrospectivo observacional realizado en una clínica ortopédica especializada en Belo Horizonte, Brasil, entre 2021 y 2023. Se invitó a pacientes sometidos a cirugía de columna (n=402) a completar el ODI a través de Google Forms en el preoperatorio y a los 30, 90, 180 y 360 días postoperatorios. La secretaria de la clínica realizaba

Study conducted by the Hospital Mater Dei, Belo Horizonte, MG, Brazil.

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contacto telefónico y enviaba el enlace del formulario por correo electrónico. Se analizaron las tasas de respuesta a lo largo del tiempo, por sexo, grupo de edad y año de inclusión. Resultados: Las tasas de respuesta fueron del 100% en el preoperatorio y a los 30 días, 93,8% a los 90 días, 84,6% a los 180 días y 62,4% a los 360 días. Los pacientes entre 41-60 años presentaron las tasas de respuesta más consistentes. Las mujeres mostraron una adherencia ligeramente superior en los períodos más largos (64,9% vs 59,3% a los 360 días). Los pacientes incluidos en 2021 y 2022 mantuvieron tasas de respuesta superiores al 98% después de un año. Conclusión: El uso de Google Forms para la aplicación longitudinal del ODI en cirugía de columna demostró ser viable y eficaz, con altas tasas de respuesta, especialmente en los períodos iniciales de seguimiento. Este enfoque ofrece una alternativa prometedora a los métodos tradicionales de recolección de datos, potencialmente mejorando la eficiencia del seguimiento postoperatorio en cirugía de columna. **Nivel de evidencia IV; estudio observacional retrospectivo.**

Descriptores: Columna Vertebral; Cirugía; Encuestas y Cuestionarios; Investigación longitudinal; Recolección de datos electrónica.

INTRODUCTION

Accurate and consistent assessment of outcomes in spine surgery is essential to determine the effectiveness of procedures and to guide the clinical management of patients¹. The Oswestry Disability Index (ODI) is one of the most widely used and validated instruments for assessing function and pain in patients with spinal disorders². However, the collection of postoperative follow-up data often presents logistical challenges and may result in lower-than-desired response rates³.

With the advancement of digital technologies, new opportunities have emerged to optimize data collection in health research. Google Forms, a free online tool for creating and administering surveys, has shown potential to facilitate data collection in various medical research contexts⁴. Its ease of use, accessibility, and ability to collect responses in real time make it an attractive option for administering standardized questionnaires such as the ODI.

Previous studies have already demonstrated the feasibility of using digital tools for data collection in spine surgery⁵. In the context of medical education, Stock and Singh⁴ applied Google Forms to provide active learning experiences to medical students during the COVID-19 pandemic, highlighting its versatility and ease of implementation.

The Brazilian version of the ODI has been validated and demonstrated excellent psychometric properties⁶. In addition, studies have shown that the ODI has good responsiveness for detecting clinical changes in patients with chronic low back pain⁷. Telephone administration of the ODI has also been validated as a reliable data collection method⁸.

Despite these promising precedents, the specific application of Google Forms for the longitudinal follow-up of patients undergoing spine surgery has not yet been systematically evaluated. Considering the importance of efficient and reliable methods for collecting surgical outcome data, this study aims to evaluate the feasibility and effectiveness of using Google Forms for applying the ODI in patients undergoing spine surgery.

METHODS

Study design

Retrospective observational study conducted at an orthopedic clinic specialized in spine surgery located in Belo Horizonte, Minas Gerais, Brazil. The data collection period was from January 2021 to June 2023.

Study population

Adult patients (≥ 18 years) undergoing spine surgical procedures at the clinic during the study period were included. The exclusion criteria were: inability to understand or respond to the questionnaire independently, and lack of access to email or an electronic device compatible with Google Forms.

Procedures

- Form creation: The ODI was transposed into Google Forms, maintaining its original structure and scoring. A personalized link was created for each assessment time point.

- Assessment time points: Patients were assessed at five time points: preoperative (t0), 30 days (t30), 90 days (t90), 180 days (t180), and 360 days (t360) after surgery.
- Contact and form delivery: The clinic secretary made telephone contact with the patients at each assessment time point, explaining how the form worked. An email containing the Google Forms link was then sent to the patient.
- Data collection: Responses were automatically recorded in a Google Sheets spreadsheet, allowing real-time monitoring of the response rate.

Variables collected

Demographic data (age, sex) and the date of form completion at each assessment period were collected.

Data analysis

Data were tabulated and analyzed considering: (1) total number of patients in each period; (2) distribution by sex; (3) distribution by age group (20-40, 41-60, 61-80, >80 years); (4) response rate at each assessment period; (5) analysis of the groups with the highest response rate. A comparative analysis of the response rate was performed between the different periods and between the different demographic groups.

RESULTS

A total of 402 patients were initially included in the study. The distribution by sex was 225 (56.0%) women and 177 (44.0%) men. The distribution by age group is detailed in Table 1 below, which shows a majority of respondents in the 41 to 60 years age group (41.8%), followed by patients aged 61–80 years (30.8%). The over-80 age group represented the smallest proportion of the sample (5.2%). (Table 1)

The response rates at each assessment period are presented in Table 2 below. A progressive decrease in the response rate is observed over time, with the largest drop occurring between 180

Table 1. Distribution of patients included in the study according to age group.

Age group	Responding patients	
	N	%
20-40 years	89	22.1
41-60 years	168	41.8
61-80 years	124	30.8
Over 80 years	21	5.2
TOTAL	402	100.0

Table 2. ODI response rates by postoperative assessment period.

Response rate	Responding patients	
	N/Total	%
Preoperative (t0)	402/402	100.0
30 days (t30)	402/402	100.0
90 days (t90)	377/402	93.8
180 days (t180)	340/402	84.6
360 days (t360)	251/402	62.4

and 360 days after surgery (22.2 percentage points), suggesting that specific retention strategies would be most needed during this period.

Next, these data are detailed in Table 3 according to the patient's year of inclusion. Patients included in 2021 and 2022 maintained response rates above 98% in all assessed follow-up periods. In 2023, a more pronounced decline was observed from t90 (81.9%) and t180 (59.1%) onward, which is expected given the shorter follow-up time available for this cohort. (Table 3)

An analysis of the response rate according to patient sex was also performed, shown in Table 4, which revealed similar response rates between men and women in the initial periods. In the longer follow-up periods (t180 and t360), women showed slightly higher adherence: 86.7% vs. 81.9% at t180 and 64.9% vs. 59.3% at t360.

The analysis over time according to the respondents' age group showed that the 41–60 years age group had the highest response rates in the initial periods (101.2% at t30, reflecting reinterventions) and the best adherence at 360 days (63.7%). The 61–80 years group maintained consistently high rates up to t180 (87.1%), with a more pronounced drop at t360 (62.1%). The 20–40 years group recorded the lowest overall adherence throughout follow-up, reaching 59.6% at t360. Surprisingly, patients over 80 years showed good adherence at t180 (90.5%), suggesting that active support from the team may compensate for possible technological barriers in this group. These results can be seen in Table 5 below.

Table 3. ODI response rates by assessment period according to year of inclusion in the study.

Response rate	Responding patients					
	2021		2022		2023	
	N/Total	%	N/Total	%	N/Total	%
30 days (t30)	101/100	101.0	152/153	99.3	149/149	100.0
90 days (t90)	103/100	103.0	152/153	99.3	122/149	81.9
180 days (t180)	101/100	101.0	151/153	98.7	88/149	59.1
360 days (t360)	101/100	101.0	150/153	98.0	*	

Note: t360 data are not available due to the follow-up time.

Table 4. ODI response rates by assessment period according to sex.

Response rate	Responding patients			
	Male		Female	
	N	%	N	%
Preoperative (t0)	177	100.0	225	100.0
30 days (t30)	178	100.6	224	99.6
90 days (t90)	166	93.8	211	93.8
180 days (t180)	145	81.9	195	86.7
360 days (t360)	105	59.3	146	64.9

Table 5. ODI response rates by age group and assessment period.

Response rate	Responding patients							
	20-40		41-60		61-80		> 80	
	N	%	N	%	N	%	N	%
Preoperative (t0)	89	100.0	168	100.0	124	100.0	21	100.0
30 days (t30)	88	98.9	170	101.2	124	100.0	20	95.2
90 days (t90)	79	88.8	159	94.6	121	97.6	18	85.7
180 days (t180)	69	77.5	144	85.7	108	87.1	19	90.5
360 days (t360)	53	59.6	107	63.7	77	62.1	14	66.7

DISCUSSION

This study evaluated the feasibility and effectiveness of using Google Forms for the longitudinal application of the ODI in patients undergoing spine surgery. The results demonstrated a high initial response rate, with a gradual decline over the follow-up period, a common pattern in longitudinal studies.

The 100% response rate in the preoperative and 30-day postoperative periods is notable and exceeds the typical rates reported in the literature for postsurgical follow-up questionnaires. This may be attributed to the ease of use of Google Forms, combined with the personalized telephone contact made by the clinic secretary.

The decline in the response rate over time, reaching 62.4% at 360 days, is still considered satisfactory for long-term studies in spine surgery. However, additional strategies may be necessary to maintain patient engagement during longer follow-up periods.

An interesting finding was observed in the 2021 data, where response rates exceeded 100% in some follow-up periods. This apparent discrepancy can be explained by the need for surgical reintervention in some patients during the follow-up period, causing them to be counted more than once in the study. This phenomenon reflects the clinical reality of spine surgery, where reinterventions are occasionally necessary, and highlights the importance of a data collection system flexible enough to accommodate these situations.

The differences observed in response rates between sexes, with women showing slightly higher adherence in the longer periods, are consistent with some previous studies on response behavior in health research. This may guide specific strategies to improve adherence among male patients.

The higher response rate observed in the 41-60 and 61-80 years age groups is an interesting finding. Contrary to the common perception that older patients may have difficulties with technology, our results suggest that this group can be particularly engaged in postoperative follow-up when provided with appropriate, simplified tools and adequate support.

The successful implementation of Google Forms in this study aligns with the findings of Stock and Singh⁴, who demonstrated the effectiveness of this tool in medical education contexts. Our study extends these observations to the field of longitudinal clinical research.

Study limitations include the lack of a control group using traditional data collection methods and the absence of analysis of the ODI scores. Future studies could address these issues and explore in greater depth the factors that influence response rates.

CONCLUSION

The use of Google Forms for the longitudinal application of the ODI in patients undergoing spine surgery proved to be a feasible and effective approach, with high response rates, especially in the initial follow-up periods. This methodology offers a promising alternative to traditional data collection methods, potentially improving the efficiency and comprehensiveness of postoperative follow-up in spine surgery.

The consistently high response rates, particularly among middle-aged and older patients, suggest that this approach may be especially beneficial for these demographic groups. However, additional strategies may be necessary to maintain high response rates during longer follow-up periods and to improve adherence among specific groups, such as younger and male patients.

Future studies could explore the integration of this methodology with electronic medical record systems and investigate its impact on the quality of the data collected and on patient satisfaction with the postoperative follow-up process.

CONFLICT OF INTEREST

All authors declare no potential conflict of interest related to this article.

CONTRIBUTIONS OF THE AUTHORS

Each author contributed individually and significantly to the development of this article. CMQ: conceptualization, data analysis, and writing; TPAR: data analysis, writing, and review; CAM: supervision, review, and editing; CRP: supervision, review, and editing; AKRCL: methodology, data acquisition, and analysis.

DATA AVAILABILITY DECLARATION

The data underlying the research are not available because they contain patients' personal information.

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