

University of Montana

ScholarWorks at University of Montana

University of Montana Conference on Undergraduate Research (UMCUR)

Comparing Preliminary Telehealth Outcomes to In-Person Delivery of a Rehabilitation Program for Stroke Survivors with Aphasia

Kortney M. Sims

University of Montana, Missoula, ks122895@umconnect.umt.edu

Claire Buehler

University of Montana, Missoula, claire.buehler@umconnect.umt.edu

Follow this and additional works at: <https://scholarworks.umt.edu/umcur>

Let us know how access to this document benefits you.

Sims, Kortney M. and Buehler, Claire, "Comparing Preliminary Telehealth Outcomes to In-Person Delivery of a Rehabilitation Program for Stroke Survivors with Aphasia" (2021). *University of Montana Conference on Undergraduate Research (UMCUR)*. 5.

https://scholarworks.umt.edu/umcur/2021/socialsciences_poster/5

This Poster is brought to you for free and open access by ScholarWorks at University of Montana. It has been accepted for inclusion in University of Montana Conference on Undergraduate Research (UMCUR) by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

Kortney Sims & Claire Buehler
Mentors: Catherine Off & Jenna Griffin

BACKGROUND & SIGNIFICANCE

Stroke & Aphasia

- ~750,000 strokes occur in the US every year-up to 40% of stroke survivors have aphasia⁸
- 2-4 million people in the US currently live with aphasia⁸
- Aphasia is a **communication disorder** caused by stroke or brain injury¹
- Aphasia impairs reading, writing/texting, speaking, & listening to others speak¹²
- Aphasia does not impair intelligence¹²

Intensive Comprehensive Aphasia Programs (ICAPS)

- Cohort-based, holistic aphasia treatment that targets communication impairments, activity limitations, and participation restrictions using principles of neuroplasticity and patient-centered care^{2,3,4,6,10,11,12,13,14}
- Intensive:** must provide a minimum of 3 hours of therapy per day for 2 weeks^{2,3,4,6,10,11,12,13,14}
- Comprehensive:** must include individual and group treatment, and family education/training^{2,3,4,6,10,11,12,13,14}
- Significantly improves communication, psychosocial, and quality of life outcomes^{2,3,4,6,10,11,13,14}

Telehealth & Aphasia Treatment

- Telehealth models of stroke and aphasia rehabilitation have grown rapidly, specifically since the onset of COVID-19 pandemic⁵
- Telehealth delivery of "usual care" aphasia therapy has been shown to be efficacious^{7,8,9,16}
- Evidence supporting the efficacy of telehealth ICAPs have yet to be reported

RESEARCH QUESTION

Does a novel telehealth ICAP provide similar communication outcomes as a long-standing in-person ICAP when participants are matched for age, sex, and time post stroke?

METHODS

Participants

- Stroke survivors with chronic aphasia (>6 months post-stroke)
- n=5 telehealth ICAP participants (summer 2020)
- n=53 in-person ICAP participants (8 ICAPs implemented 2014-2019)

Participant ID	Age	Sex	Time Post Stroke	Occupational History	WAB-R PreAQ	WAB-R Post AQ	WAB-R Change Score
TELE-001	46	M	9.00	Photographer/ drone pilot	69.4	71.7	2.3
In-Person Mean	51	M	10.00		78.9	84.9	6.0
TELE-002	43	F	18.00	Supply Chain Manager	65.8	66.6	0.8
In-Person Mean	48	F	18.00		57.75	62.6	4.85
TELE-003	55	M	10.00	Civil engineer	85.8	89.5	3.7
In-Person Mean	55.5	M	9.25		61.08	65.7	4.625
TELE-004	72	M	17.00	Assistant District Attorney	12.1	24.6	12.5
In-Person Mean	75.25	M	15.50		46.85	50.93	4.08
TELE-005	70	M	24.00	Dentist	56.4	64.2	7.8
In-Person Mean	67.75	M	26.25		29.93	37.13	7.20

Research Design

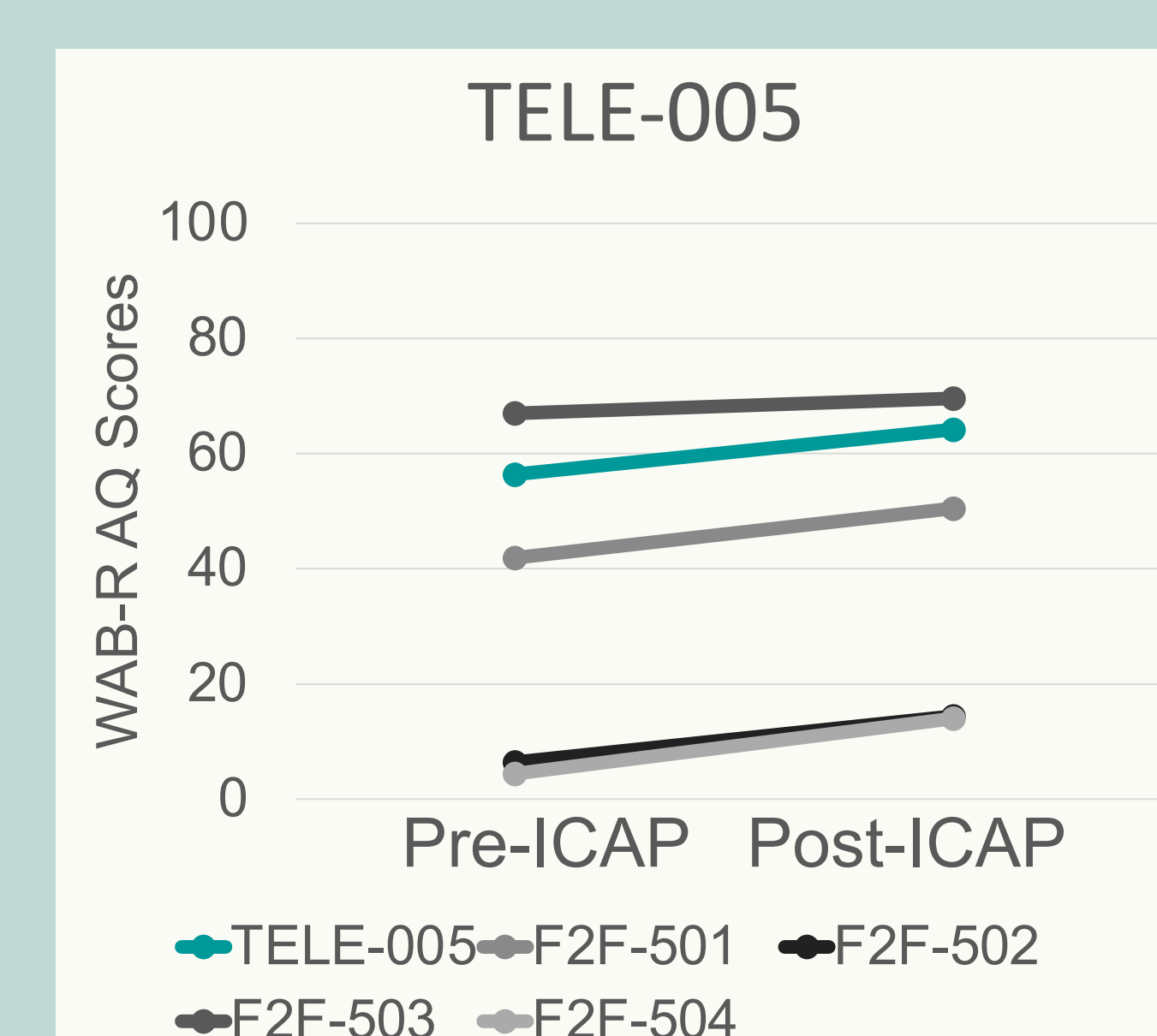
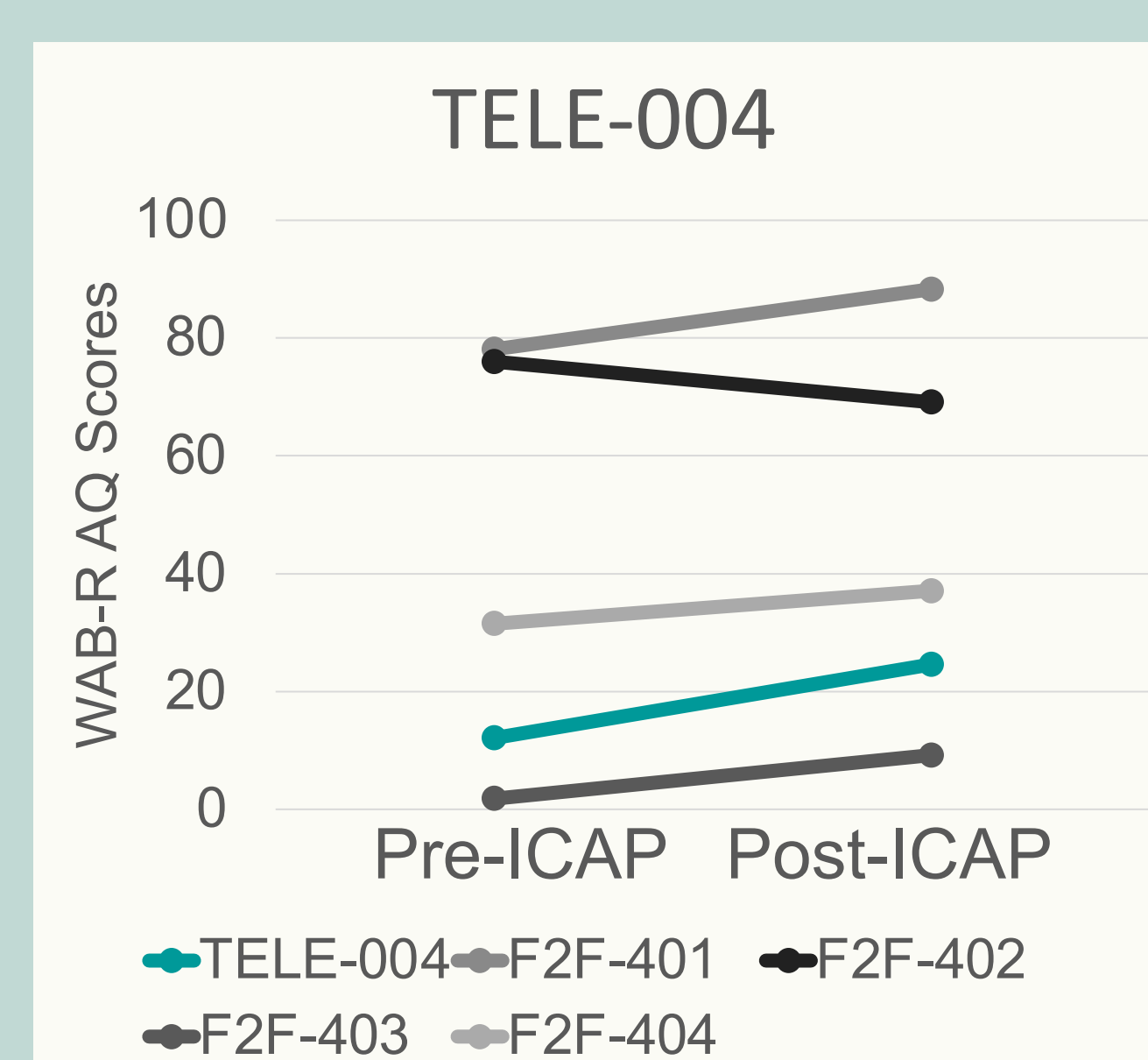
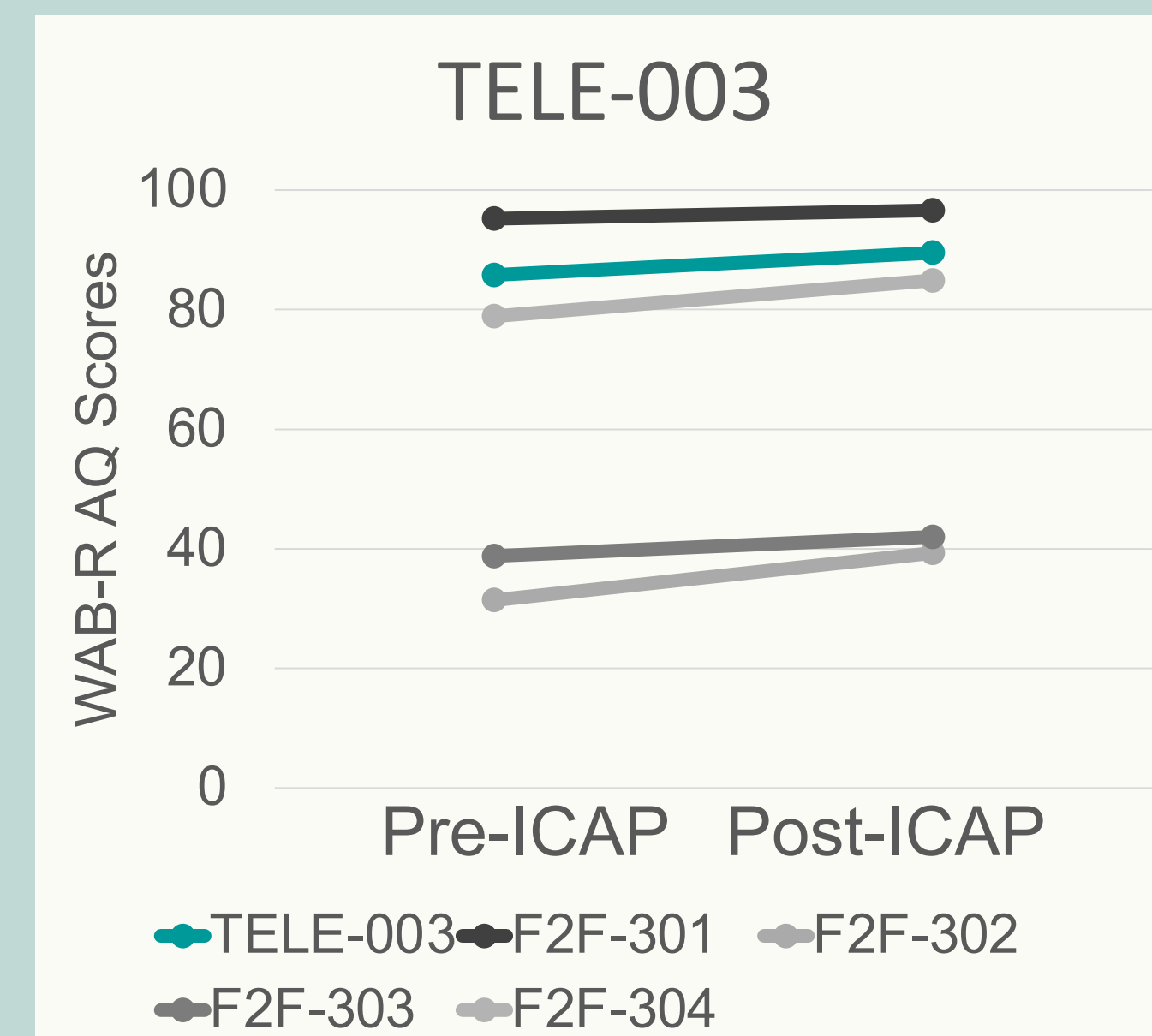
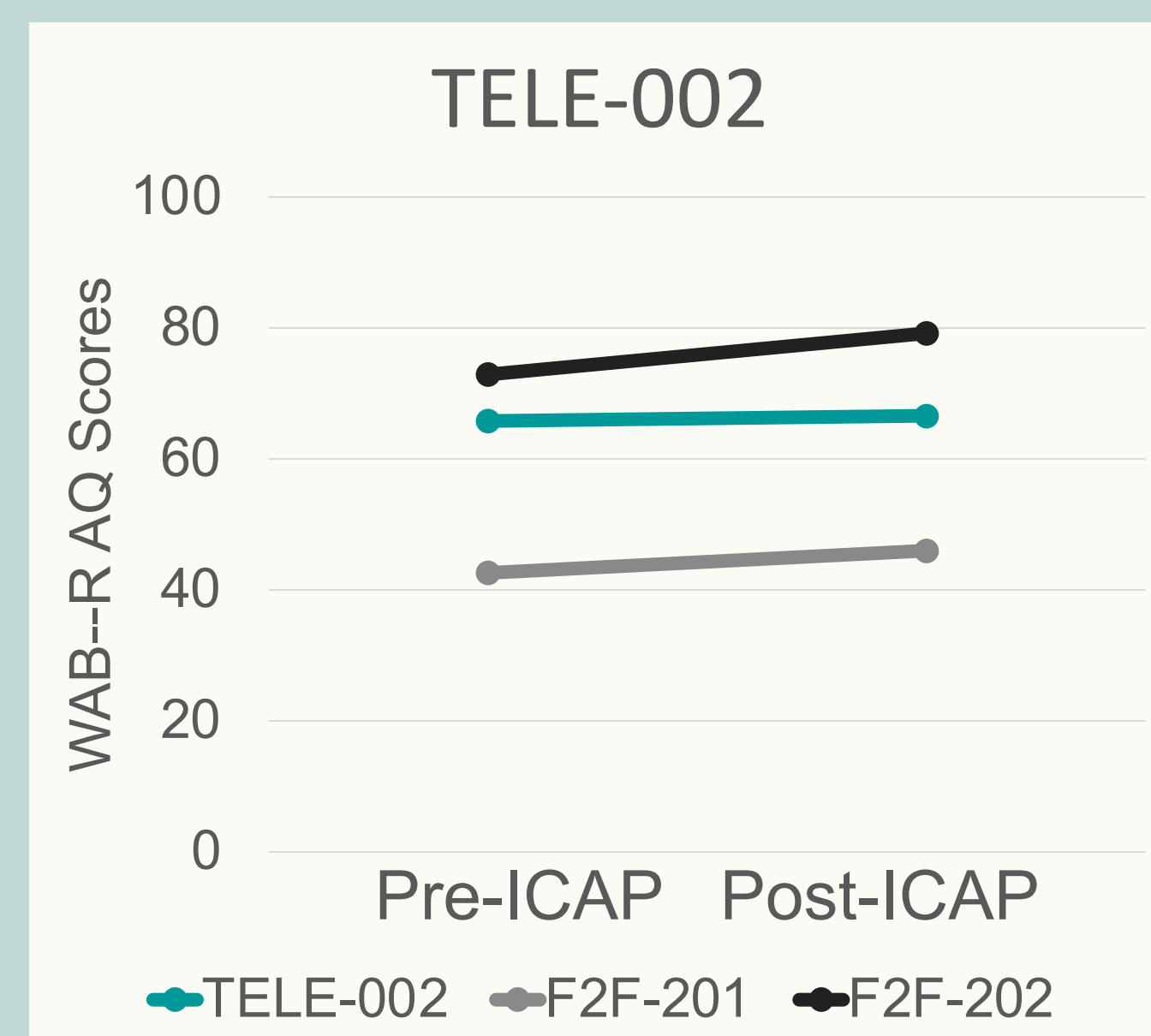
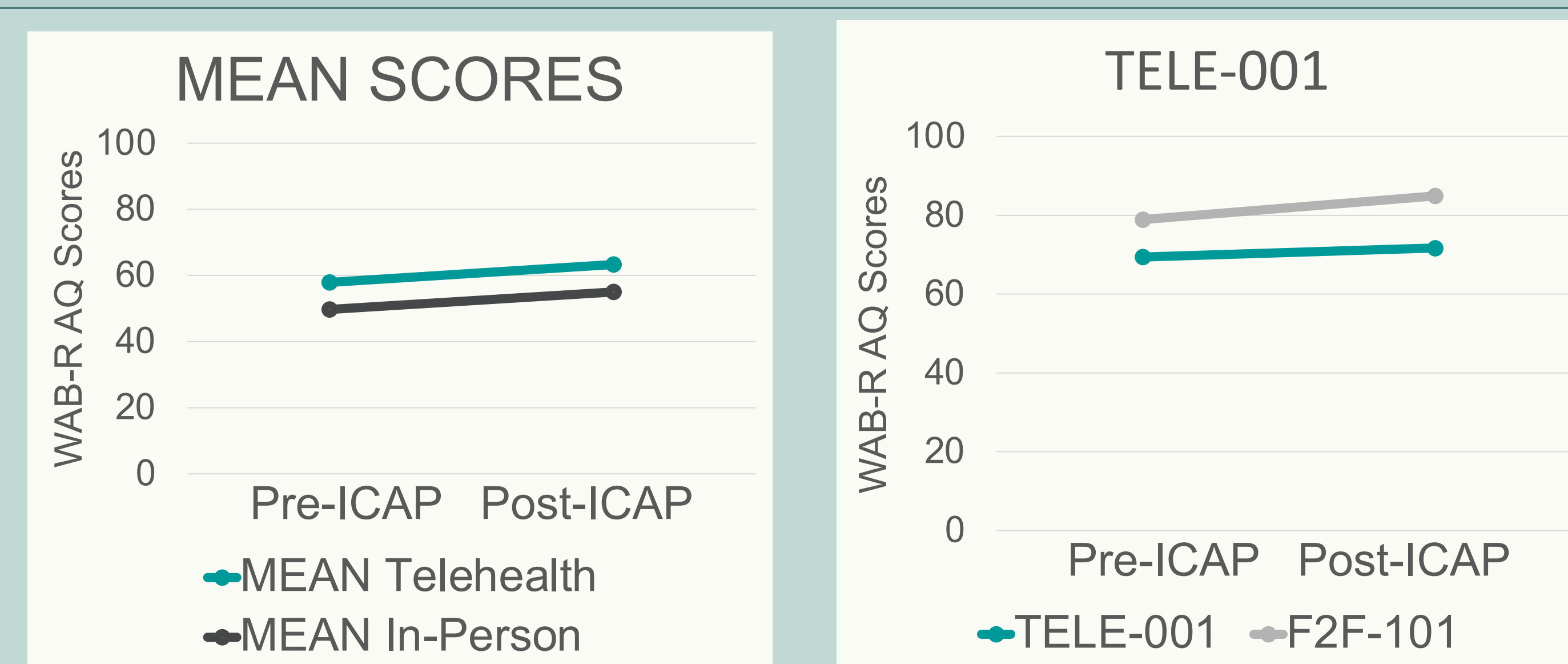
- Retrospective, pre/post group design
- Comparison of telehealth & in-person ICAP cohorts

Procedures

- Telehealth participants were matched with participants from the 2014-2019 data set
- Participants were matched for **age** (+/- 10 years), **biological sex**, & **time post stroke** (+/- 6 months)
- Communication outcomes were evaluated before and after each ICAP using the *Western Aphasia Battery-Revised* (WAB-R) Aphasia Quotient (AQ)
- Pre/post-ICAP WAB-R AQ scores were compared across telehealth and in-person participants to assess telehealth ICAP efficacy

RESULTS

	Telehealth ICAP (2020)	In-Person ICAPs (2014-2019)
Total Treatment Hours	45	Mean = 66
Mean Pre-ICAP WAB-R AQ	57.9/100	49.72/100
Mean Post-ICAP WAB-R AQ	63.32/100	55.01/100
Mean Change Score WAB-R AQ	5.42	5.29



SUMMARY OF FINDINGS & IMPACT

Communication outcomes for stroke survivors with aphasia who participated in a novel telehealth ICAP (summer 2020) were similar to outcomes from long-standing in-person ICAPs (2014-2019)

- Telehealth ICAPs are likely to be as efficacious as in-person ICAPs
- Offering both in-person and telehealth ICAPs may increase access to post-stroke services for stroke survivors with aphasia beyond the COVID pandemic – increasing the potential to reduce rural health disparities in Montana and the Mountain West

Participant ID	ICAP Session	Sex	Age	Time Post Stroke (months)	Education Level	Occupational History	Years of Education	WAB-R Pre-AQ	WAB-R Post-AQ	Change Points
TELE-001	Summer 2020	M	46	9	High school	Photographer/ drone pilot	12	69.4	71.7	2.3
F2F-101	Summer 2015	M	51	10	High School/ Vocational/ Some College	Brick Layer	12.00	78.90	84.90	6
TELE-002	Summer 2020	F	43	18	College Graduate	Supply Chain Manager	16	65.8	66.6	0.8
F2F-201	Summer 2016	F	48	21	High School/ Vocational/ Some College	Accounting	13.50	42.60	46.00	3.4
F2F-202	Summer 2019	F	48	15	College Graduate	Registered Dietician	17.00	72.90	79.20	6.3
TELE-003	Summer 2020	M	55	10	College Graduate	Civil engineer	16	85.8	89.5	3.7
F2F-301	Summer 2015	M	49	10	High School/ Vocational/ Some College	Telecommunication; Family Cattle Ranching	13.50	95.20	96.60	1.4
F2F-302	Summer 2015	M	62	6	High School/ Vocational/ Some College	US Navy; Trucking; Dispatcher	12.00	31.40	39.30	7.9
F2F-303	Summer 2017B	M	60	11	High School/ Vocational/ Some College	Carpenter	12.00	38.80	42.00	3.2
F2F-304	Summer 2015	M	51	10	High School/ Vocational/ Some College	Brick Layer	12.00	78.9	84.9	6
TELE-004	Summer 2020	M	72	17	College Graduate	Assistant District attorney Private practice criminal defense	20	12.1	24.6	12.5
F2F-401	Summer 2015	M	75	12	High School/ Vocational/ Some College	Large Engine Mechanic	14.00	78.10	88.30	10.2
F2F-402	Summer 2015	M	78	18	College Graduate	Professor/Psychologist	20.00	76.00	69.10	-6.9
F2F-403	Summer 2016	M	72	15	College Graduate	Sales [Department Store]	16.00	1.80	9.20	7.4
F2F-404	Summer 2018	M	76	17	High School/ Vocational/ Some College	Parts Mechanic	14.00	31.50	37.10	5.6
TELE-005	Summer 2020	M	70	24	College Graduate	Dentist	20+	56.4	64.2	7.8
F2F-501	Summer 2015	M	73	28	College Graduate	Health Physicist	18.00	41.90	50.50	8.6
F2F-502	Summer 2017A	M	73	27	College Graduate	Sales [Department Store]	16.00	6.40	14.40	8
F2F-503	Summer 2017A	M	62	23	College Graduate	US Air Force	18.00	67.00	69.60	2.6
F2F-504	Summer 2019	M	63	27	Vocational/Some College	Mechanic/Truck Driver	14.00	4.40	14.00	9.6

Kortney Sims & Claire Buehler
Mentors: Catherine Off & Jenna Griffin

BACKGROUND & SIGNIFICANCE

Stroke & Aphasia

- ~750,000 strokes occur in the US every year-up to 40% of stroke survivors have aphasia⁸
- 2-4 million people in the US currently live with aphasia⁸
- Aphasia is a **communication disorder** caused by stroke or brain injury¹
- Aphasia impairs reading, writing/texting, speaking, & listening to others speak¹²
- Aphasia does not impair intelligence¹²

Intensive Comprehensive Aphasia Programs (ICAPS)

- Cohort-based, holistic aphasia treatment that targets communication impairments, activity limitations, and participation restrictions using principles of neuroplasticity and patient-centered care^{2, 3, 4, 6, 10, 11, 12, 13, 14}
- Intensive:** must provide a minimum of 3 hours of therapy per day for 2 weeks^{2,3,4,6,10, 11, 12, 13, 14}
- Comprehensive:** must include individual and group treatment, and family education/training^{2,3,4,6 10, 11, 12, 13, 14}
- Significantly improves communication, psychosocial, and quality of life outcomes^{2,3,4,6,10,11,13, 14}

Telehealth & Aphasia Treatment

- Telehealth models of stroke and aphasia rehabilitation have grown rapidly, specifically since the onset of COVID-19 pandemic⁵
- Telehealth delivery of "usual care" aphasia therapy has been shown to be efficacious^{7, 8, 9, 16}
- Evidence supporting the efficacy of telehealth ICAPs have yet to be reported

RESEARCH QUESTION

Does a novel telehealth ICAP provide similar communication outcomes as a long-standing in-person ICAP when participants are matched for age, sex, and time post stroke?

METHODS

Participants

- Stroke survivors with chronic aphasia (>6 months post-stroke)
- n=5 telehealth ICAP participants (summer 2020)
- n=53 in-person ICAP participants (8 ICAPs implemented 2014-2019)

Participant ID	Age	Sex	Time Post Stroke	Occupational History	WAB-R PreAQ	WAB-R Post AQ	WAB-R Change Score
TELE-001	46	M	9.00	Photographer/ drone pilot	69.4	71.7	2.3
In-Person Mean	51	M	10.00		78.9	84.9	6.0
TELE-002	43	F	18.00	Supply Chain Manager	65.8	66.6	0.8
In-Person Mean	48	F	18.00		57.75	62.6	4.85
TELE-003	55	M	10.00	Civil engineer	85.8	89.5	3.7
In-Person Mean	55.5	M	9.25		61.08	65.7	4.625
TELE-004	72	M	17.00	Assistant District Attorney	12.1	24.6	12.5
In-Person Mean	75.25	M	15.50		46.85	50.93	4.08
TELE-005	70	M	24.00	Dentist	56.4	64.2	7.8
In-Person Mean	67.75	M	26.25		29.93	37.13	7.20

Research Design

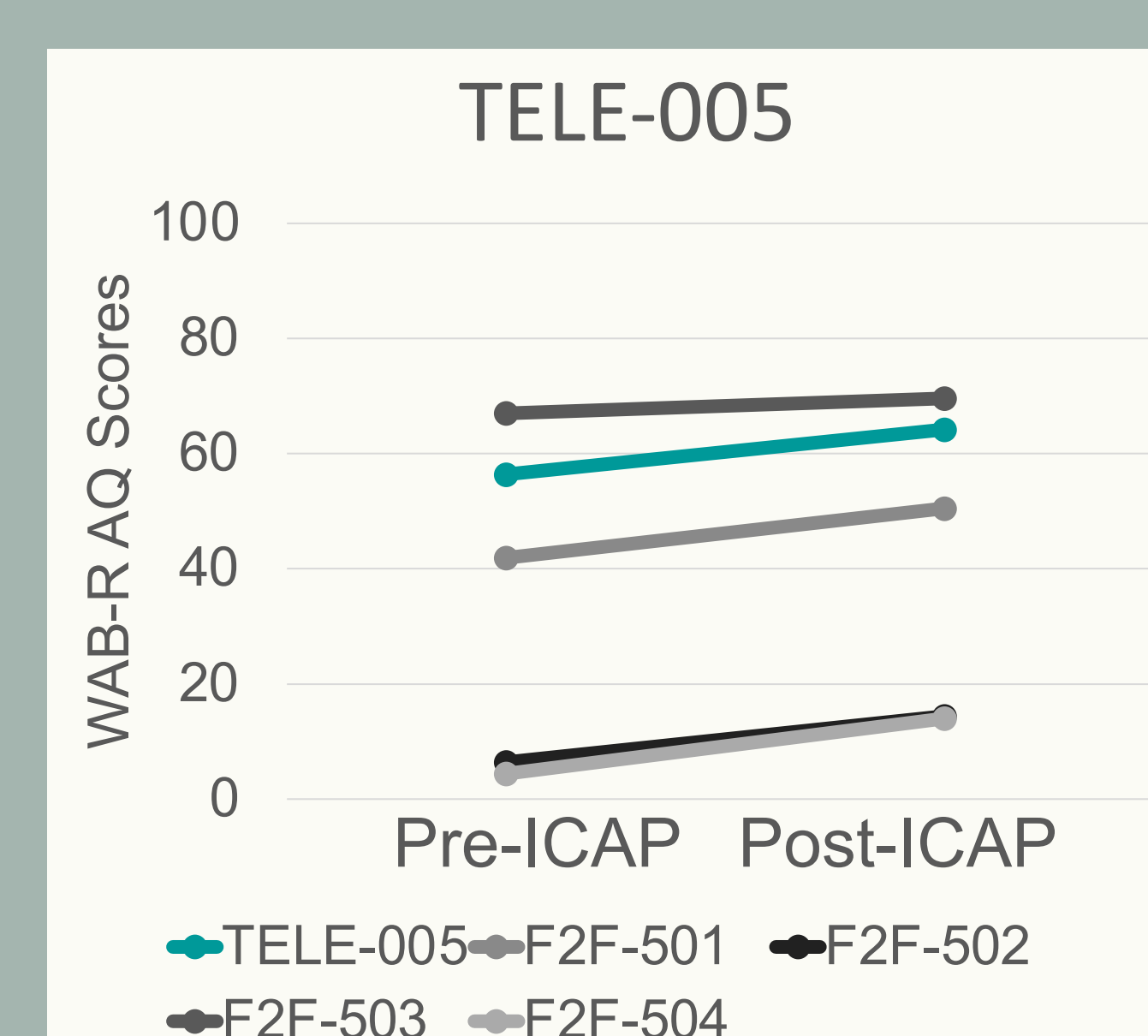
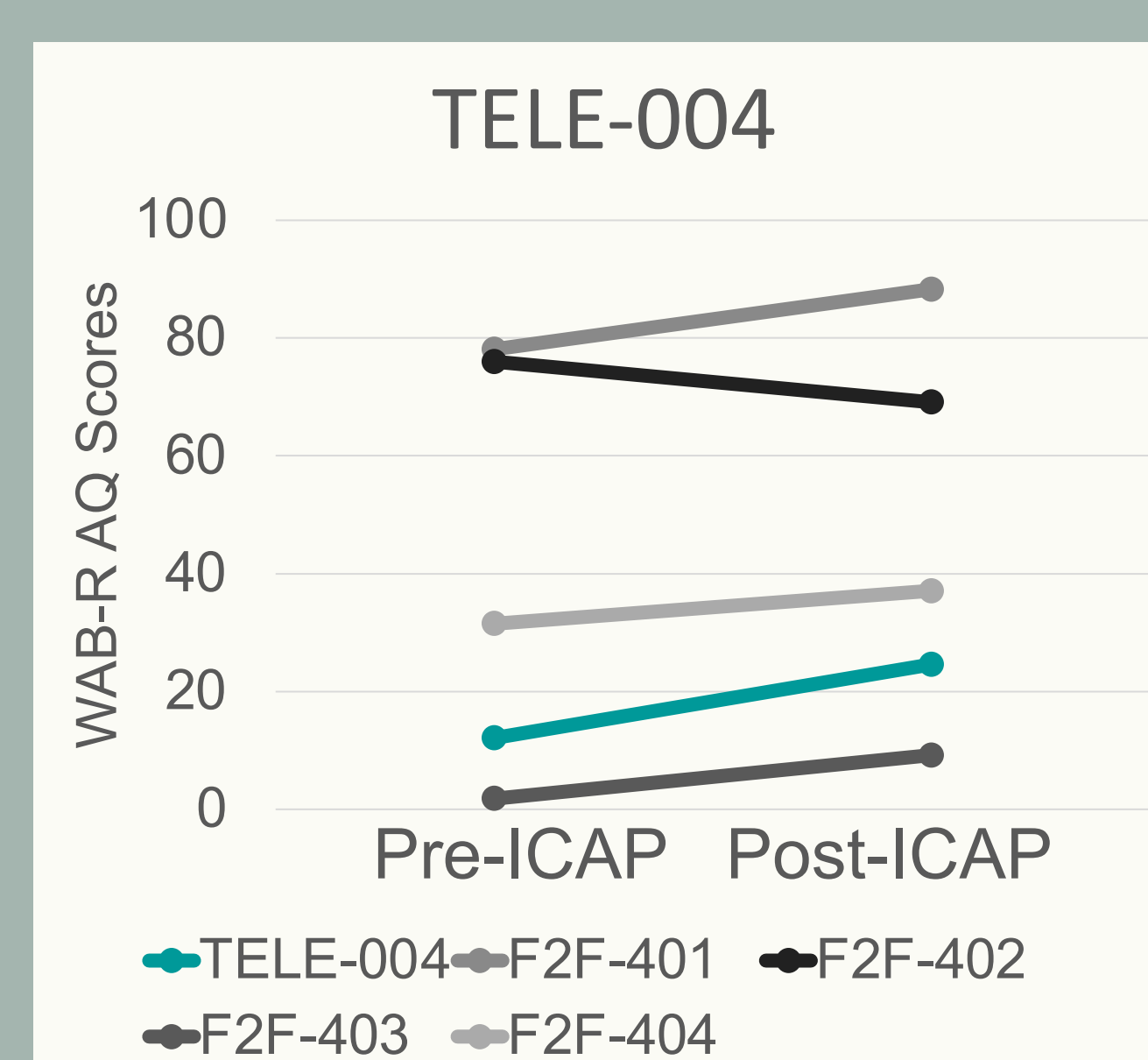
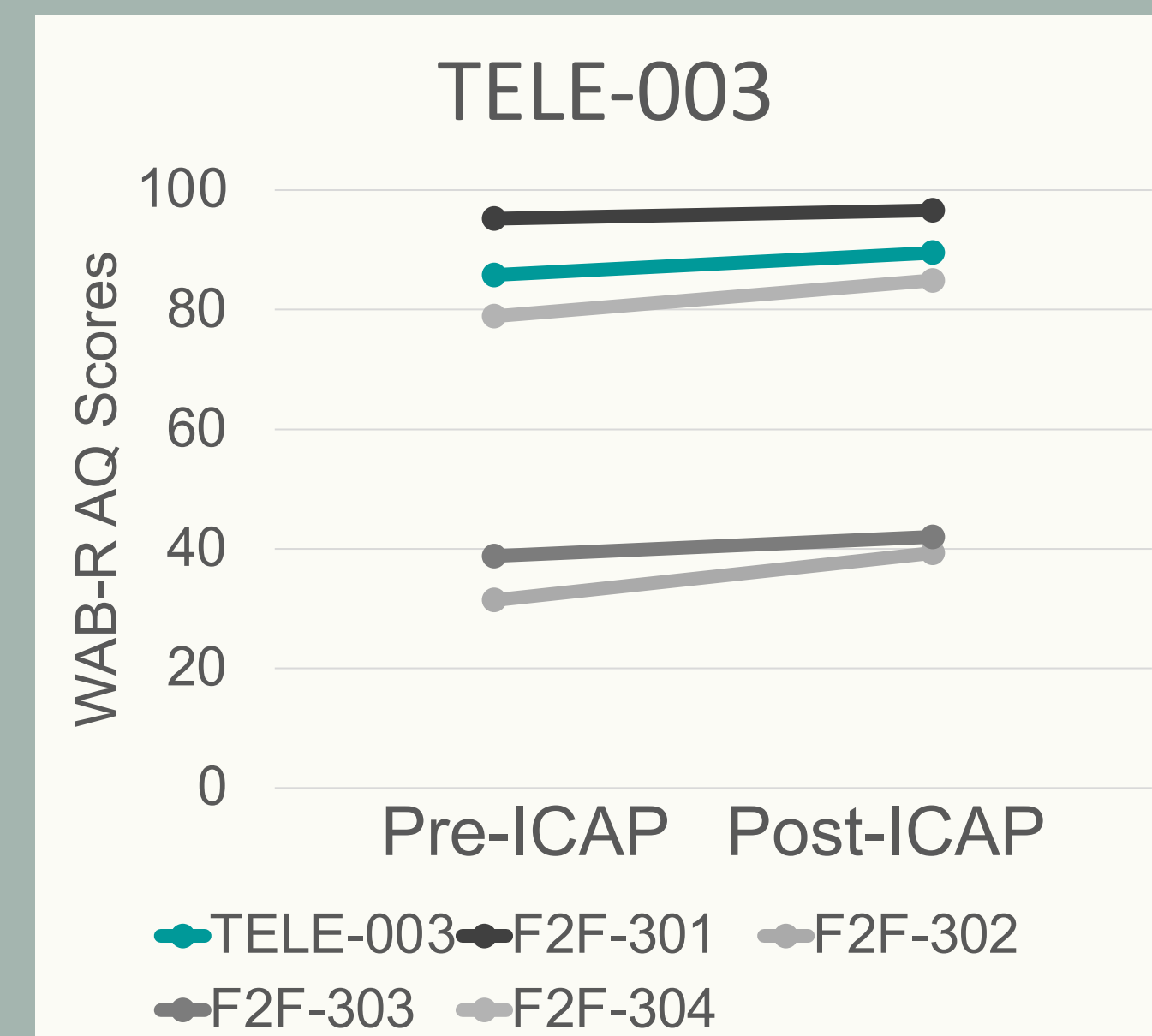
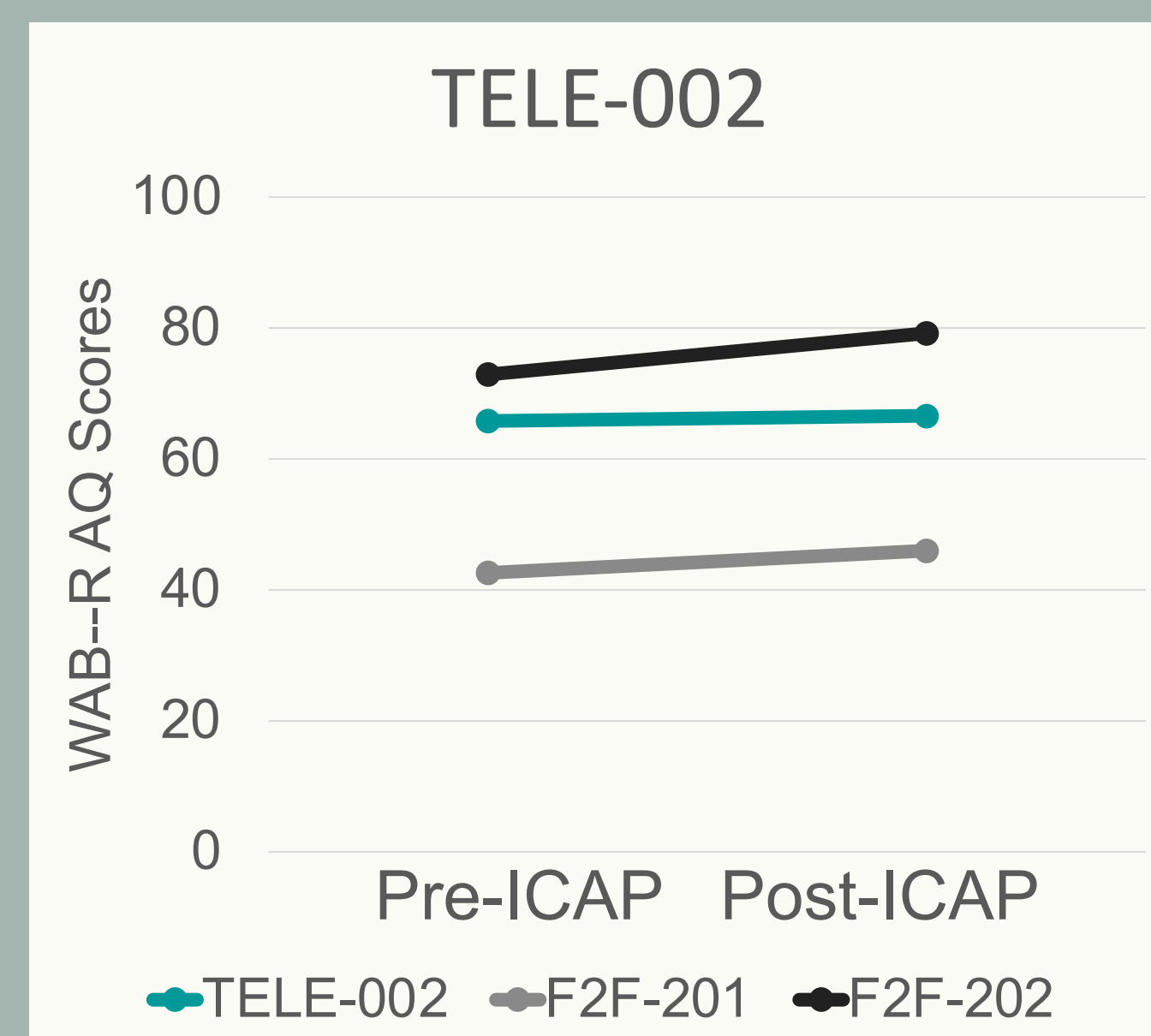
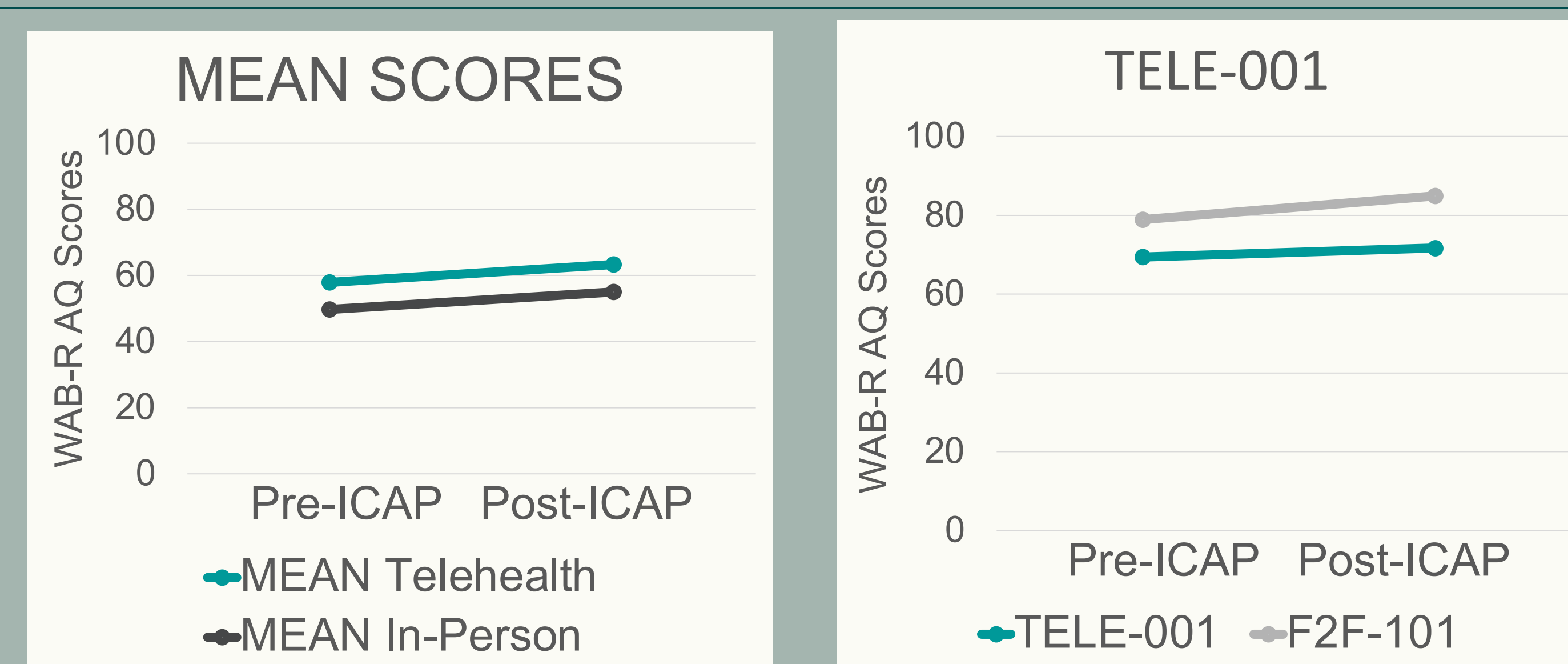
- Retrospective, pre/post group design
- Comparison of telehealth & in-person ICAP cohorts

Procedures

- Telehealth participants were matched with participants from the 2014-2019 data set
- Participants were matched for **age** (+/- 10 years), **biological sex**, & **time post stroke** (+/- 6 months)
- Communication outcomes were evaluated before and after each ICAP using the *Western Aphasia Battery-Revised* (WAB-R) Aphasia Quotient (AQ)
- Pre/post-ICAP WAB-R AQ scores were compared across telehealth and in-person participants to assess telehealth ICAP efficacy

RESULTS

	Telehealth ICAP (2020)	In-Person ICAPs (2014-2019)
Total Treatment Hours	45	Mean = 66
Mean Pre-ICAP WAB-R AQ	57.9/100	49.72/100
Mean Post-ICAP WAB-R AQ	63.32/100	55.01/100
Mean Change Score WAB-R AQ	5.42	5.29

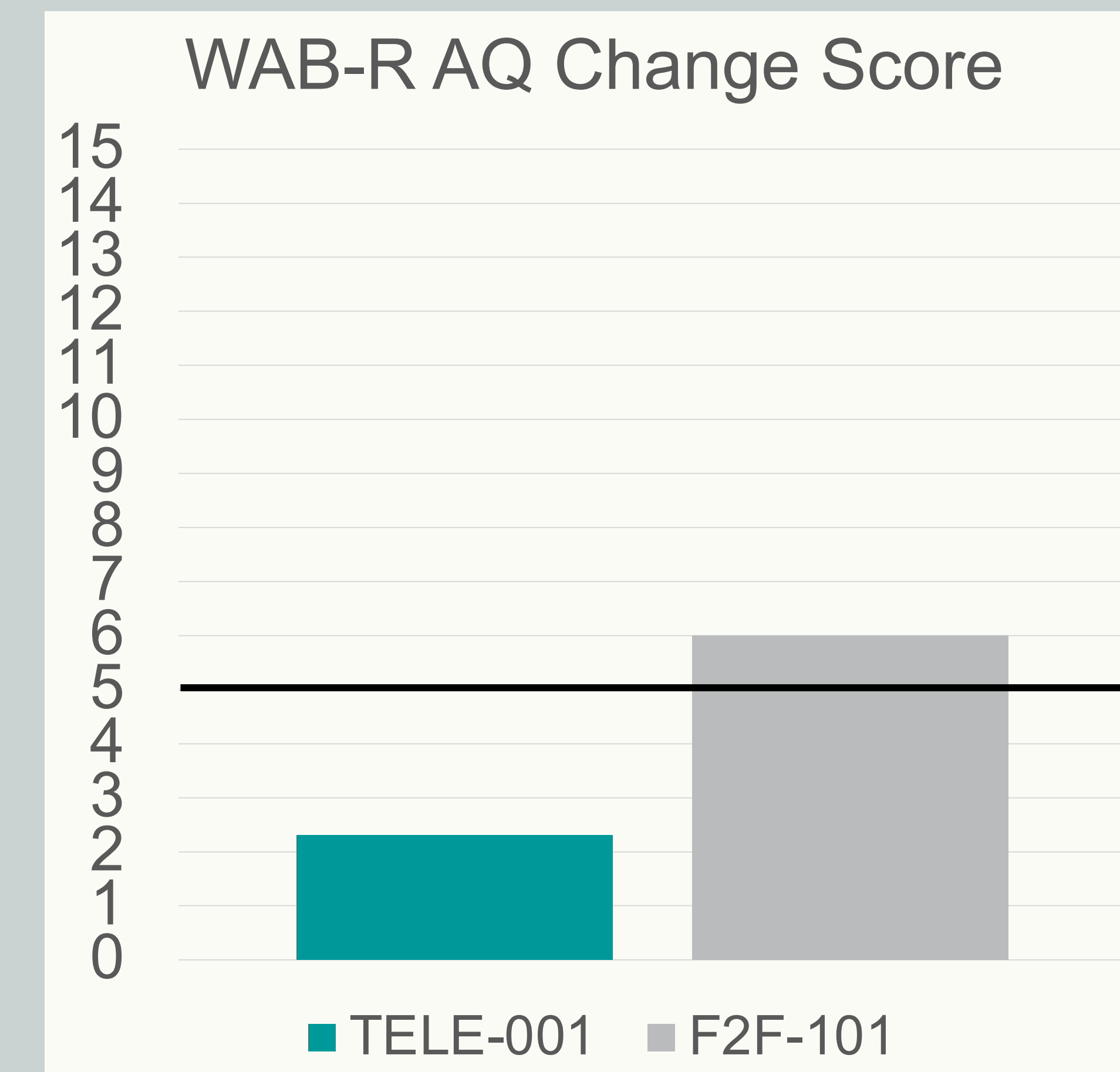
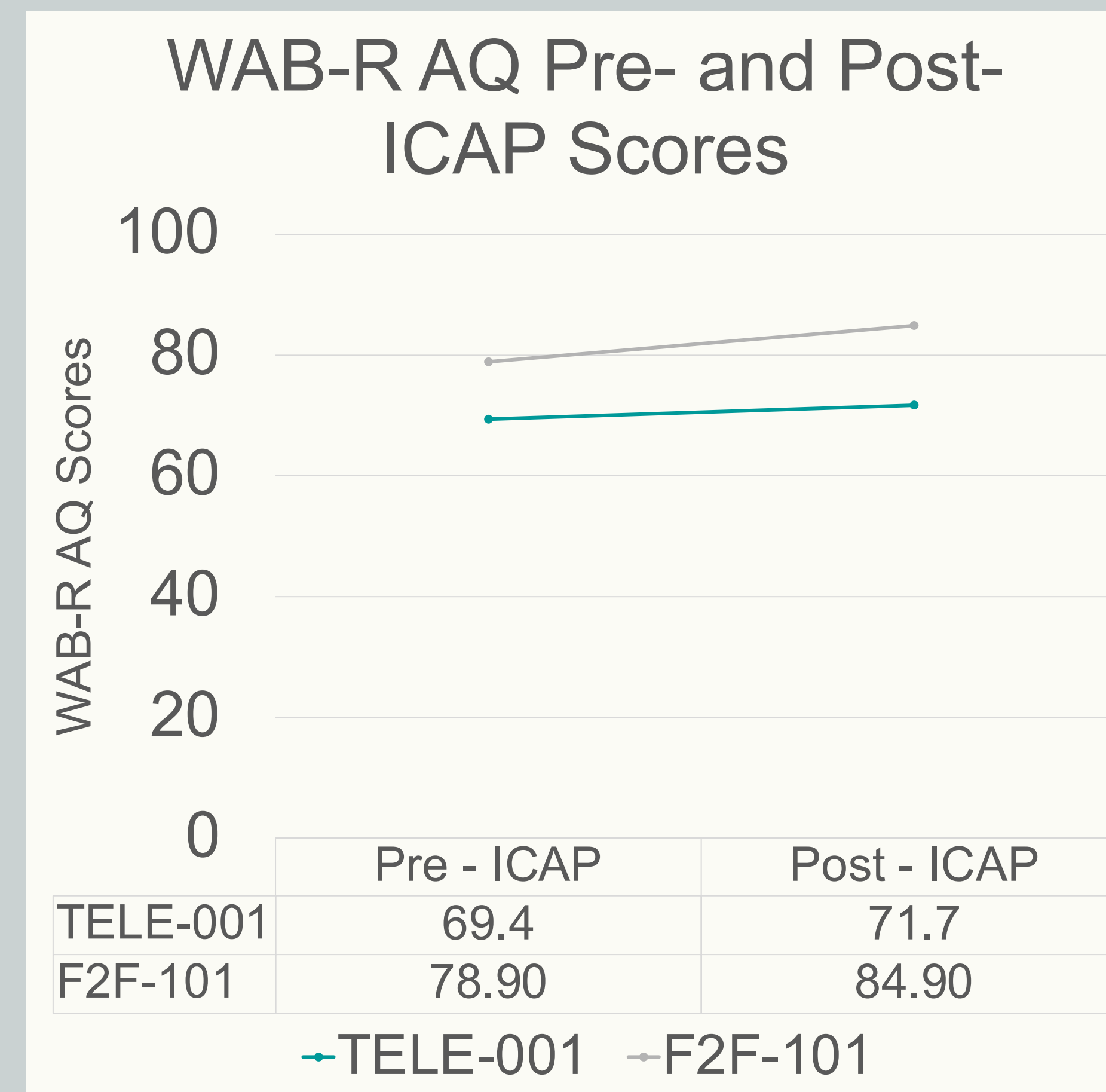


SUMMARY OF FINDINGS & IMPACT

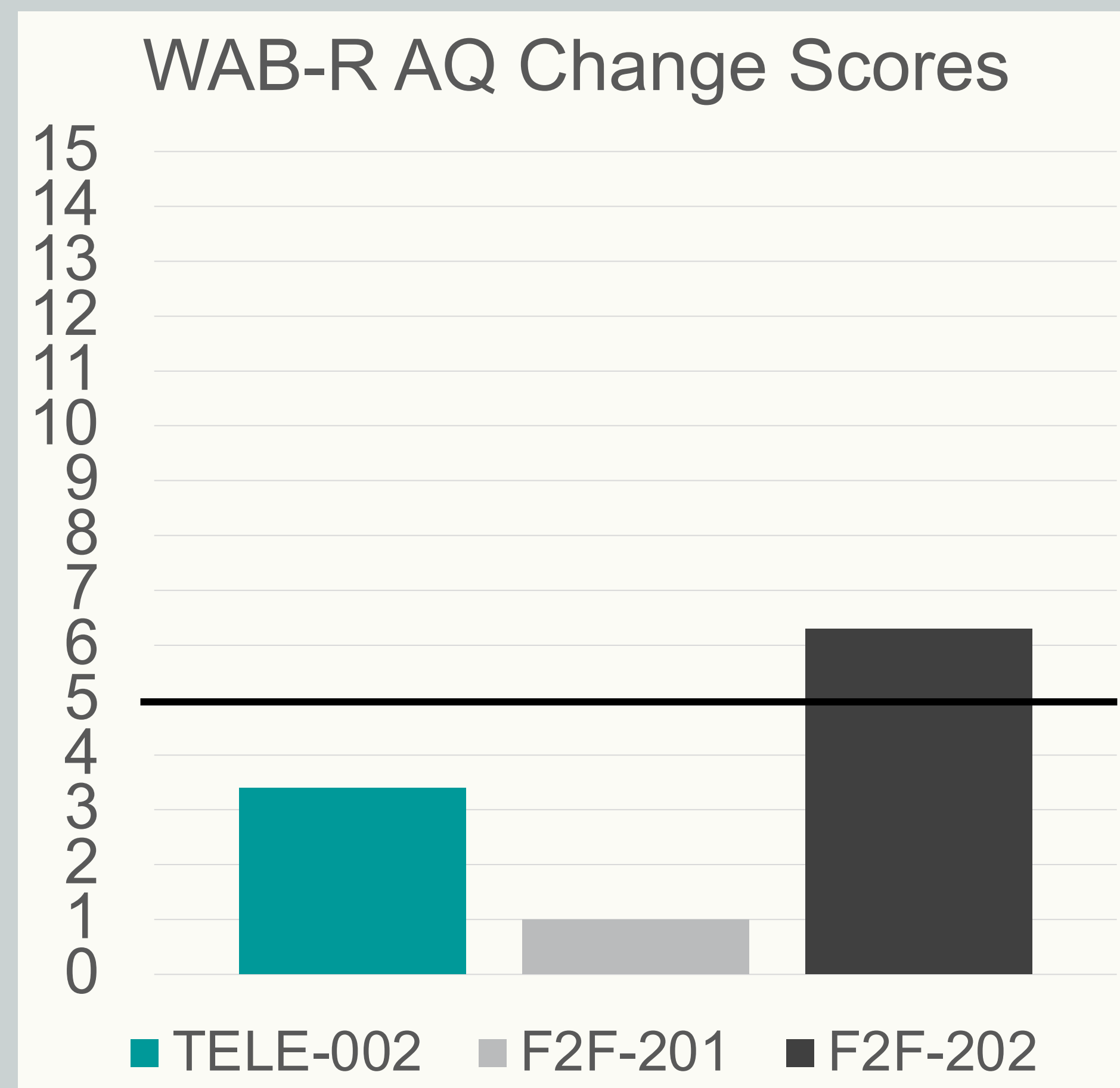
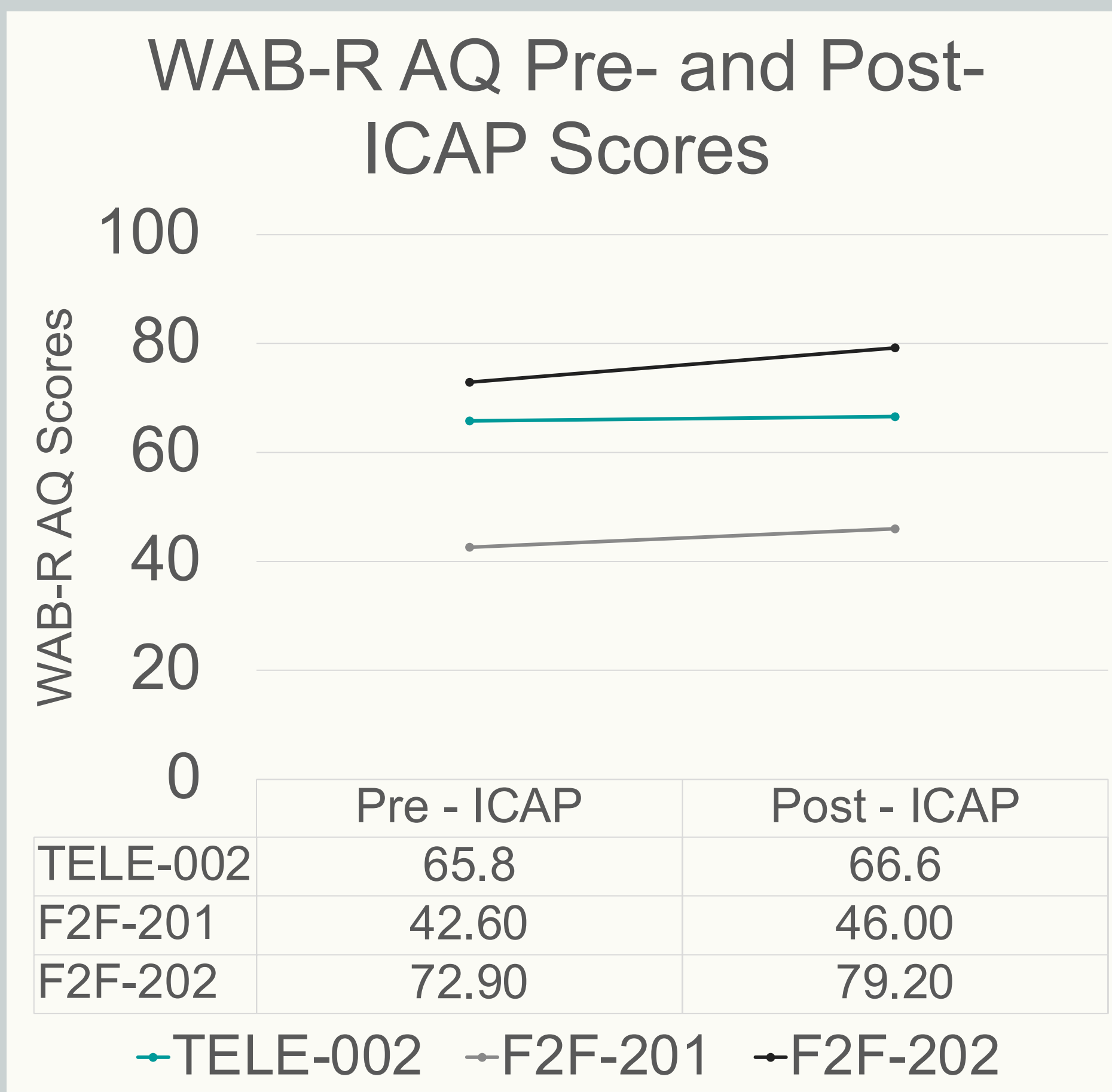
Communication outcomes for stroke survivors with aphasia who participated in a novel telehealth ICAP (summer 2020) were similar to outcomes from long-standing in-person ICAPs (2014-2019)

- Telehealth ICAPs are likely to be as efficacious as in-person ICAPs
- Offering both in-person and telehealth ICAPs may increase access to post-stroke services for stroke survivors with aphasia beyond the COVID pandemic – increasing the potential to reduce rural health disparities in Montana and the Mountain West

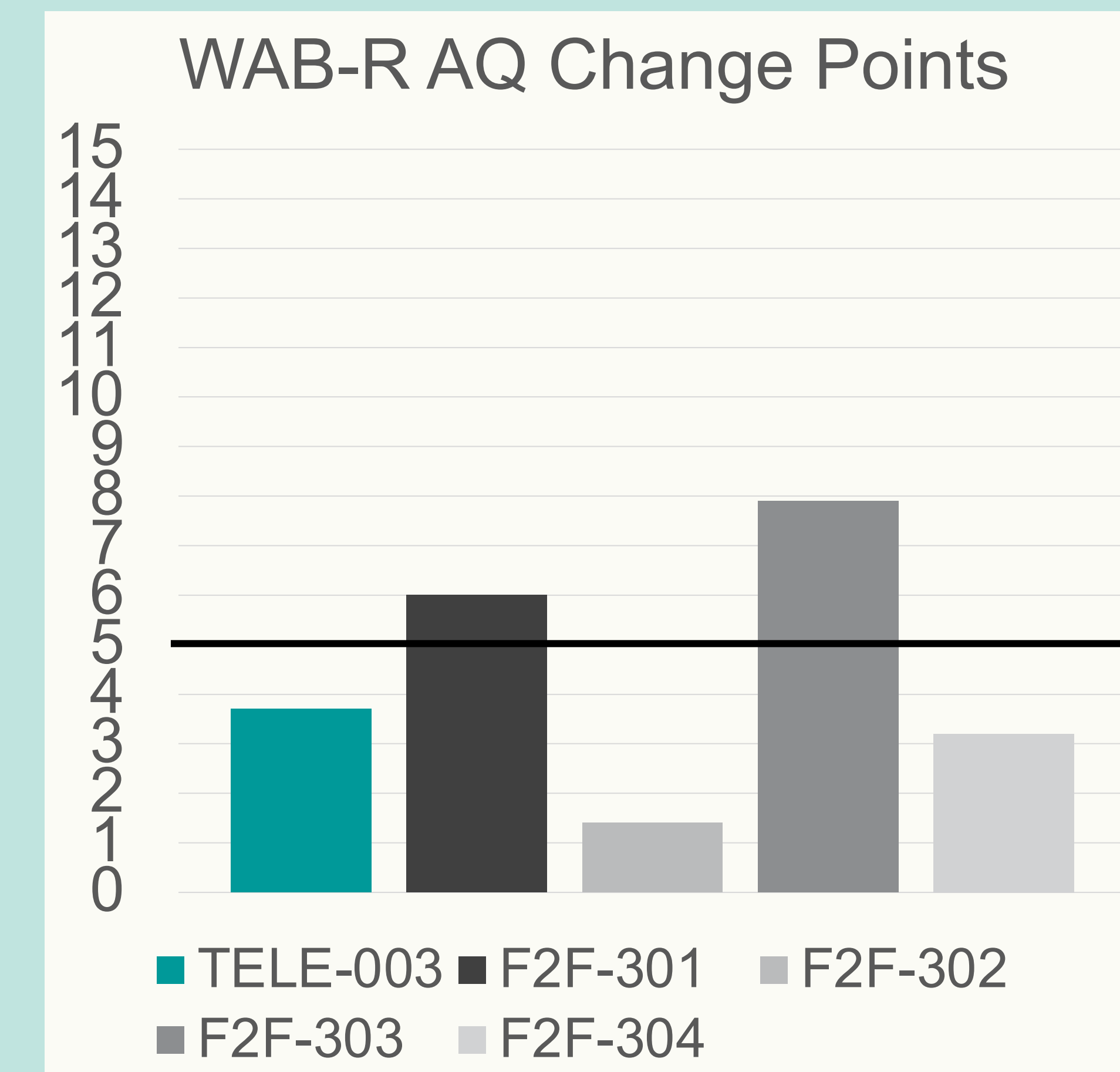
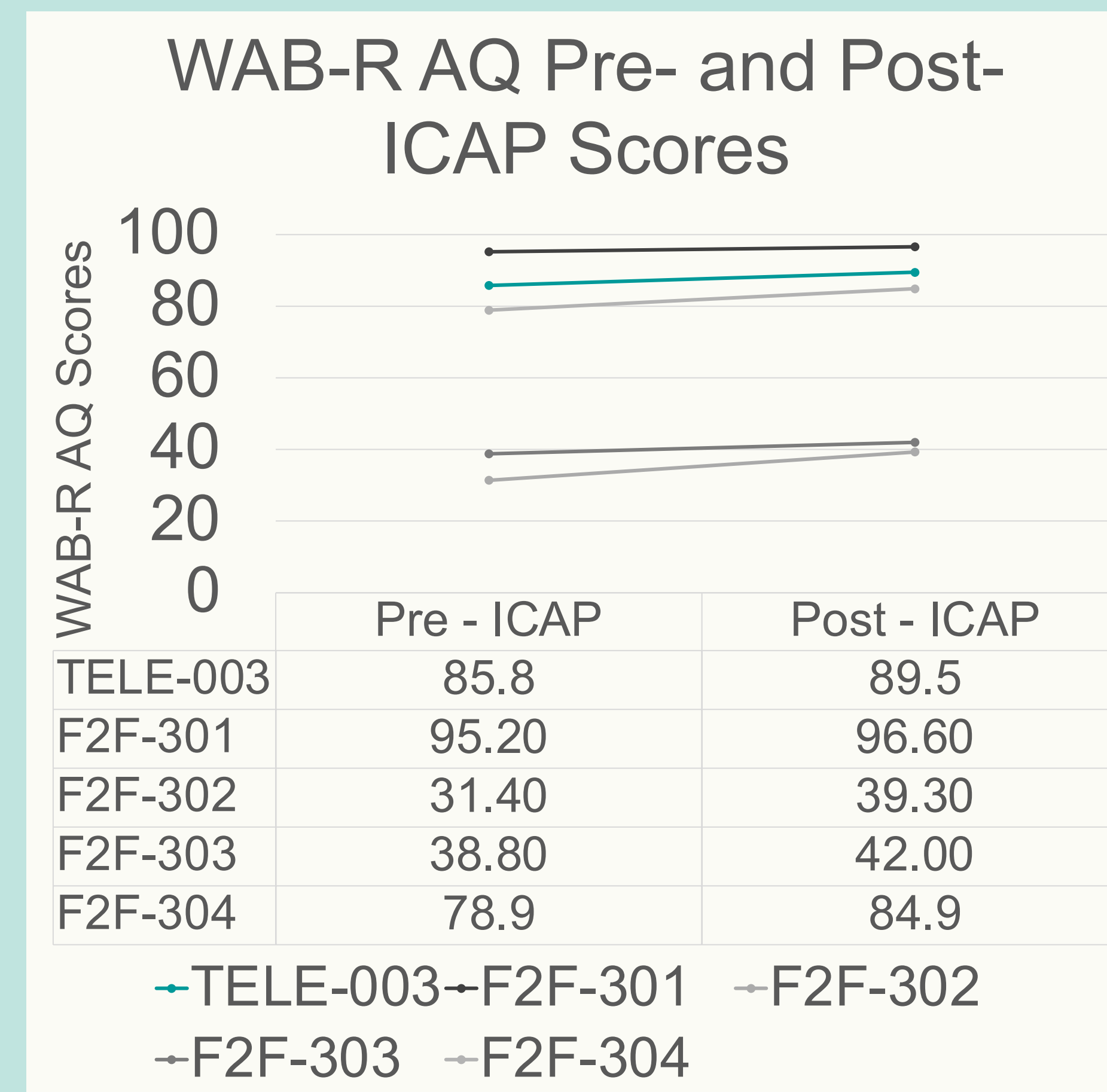
	Telehealth ICAP (2020)	In-Person ICAPs (2014-2019)
Total Treatment Hours	45	Mean = 66
Mean Pre-ICAP WAB-R AQ	57.9/100	49.72/100
Mean Post-ICAP WAB-R AQ	63.32/100	55.01/100
Mean Change Score WAB-R AQ	5.42	5.29



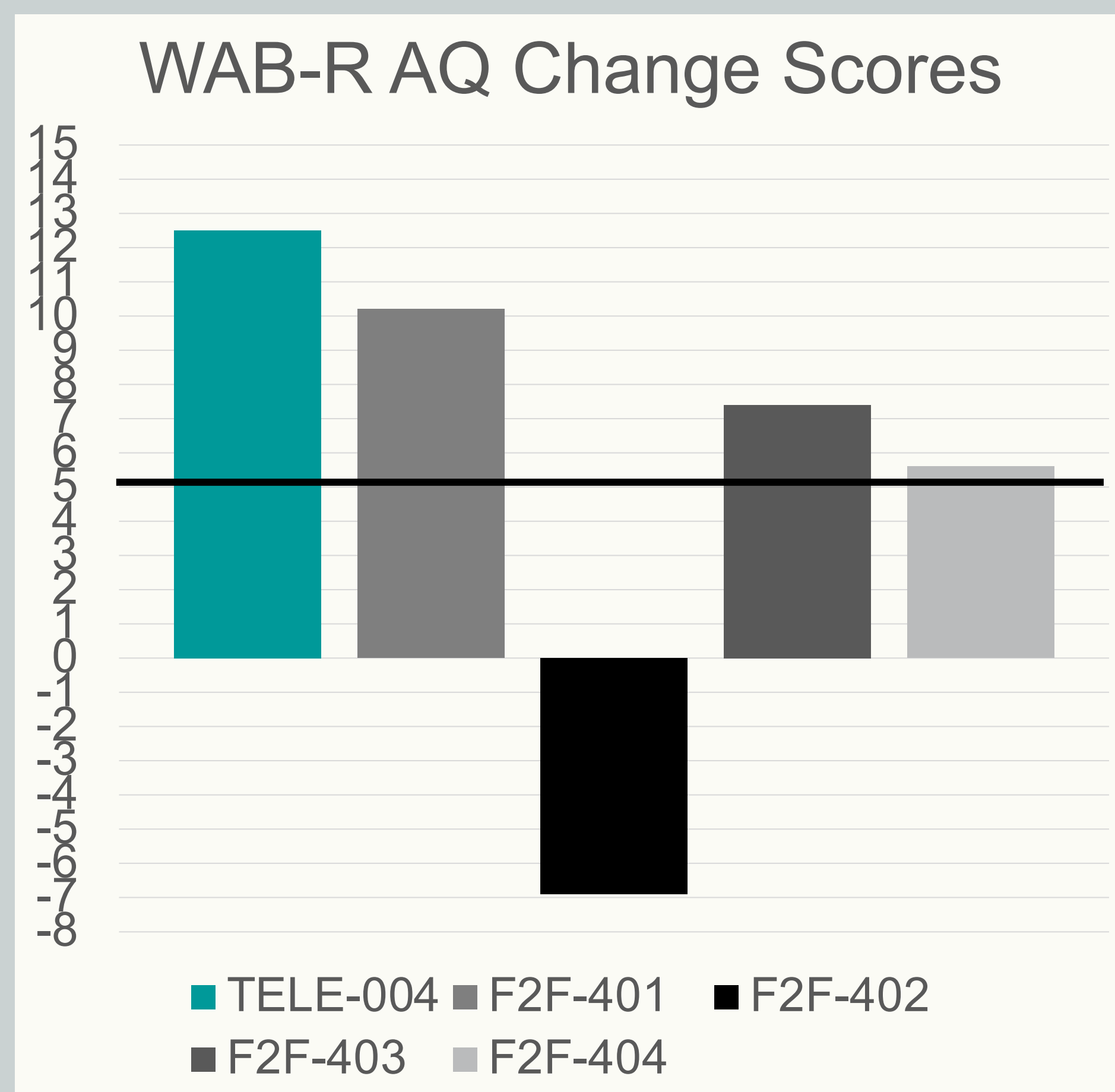
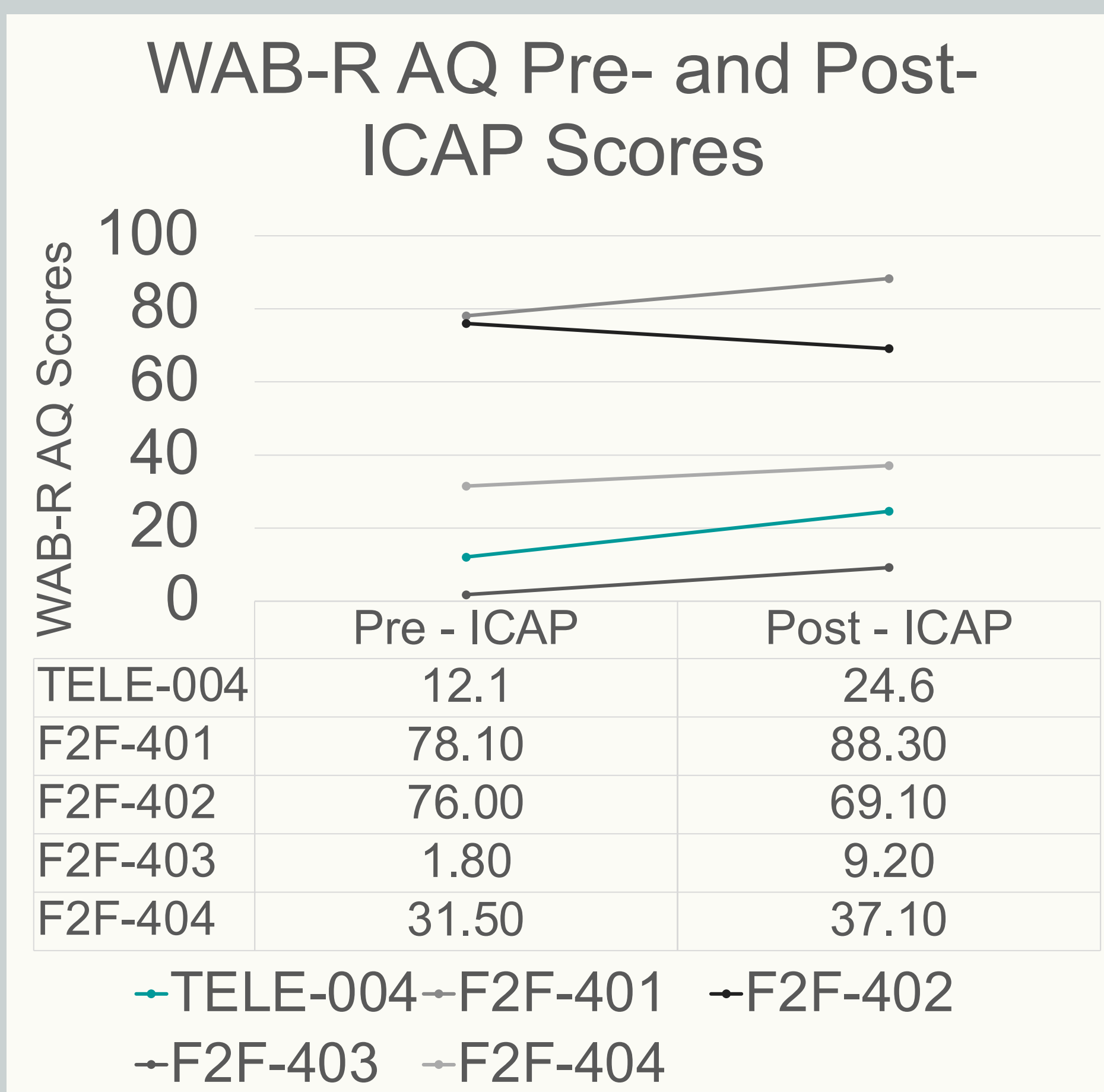
TELE-001- 46 year old male that was 9 months post stroke



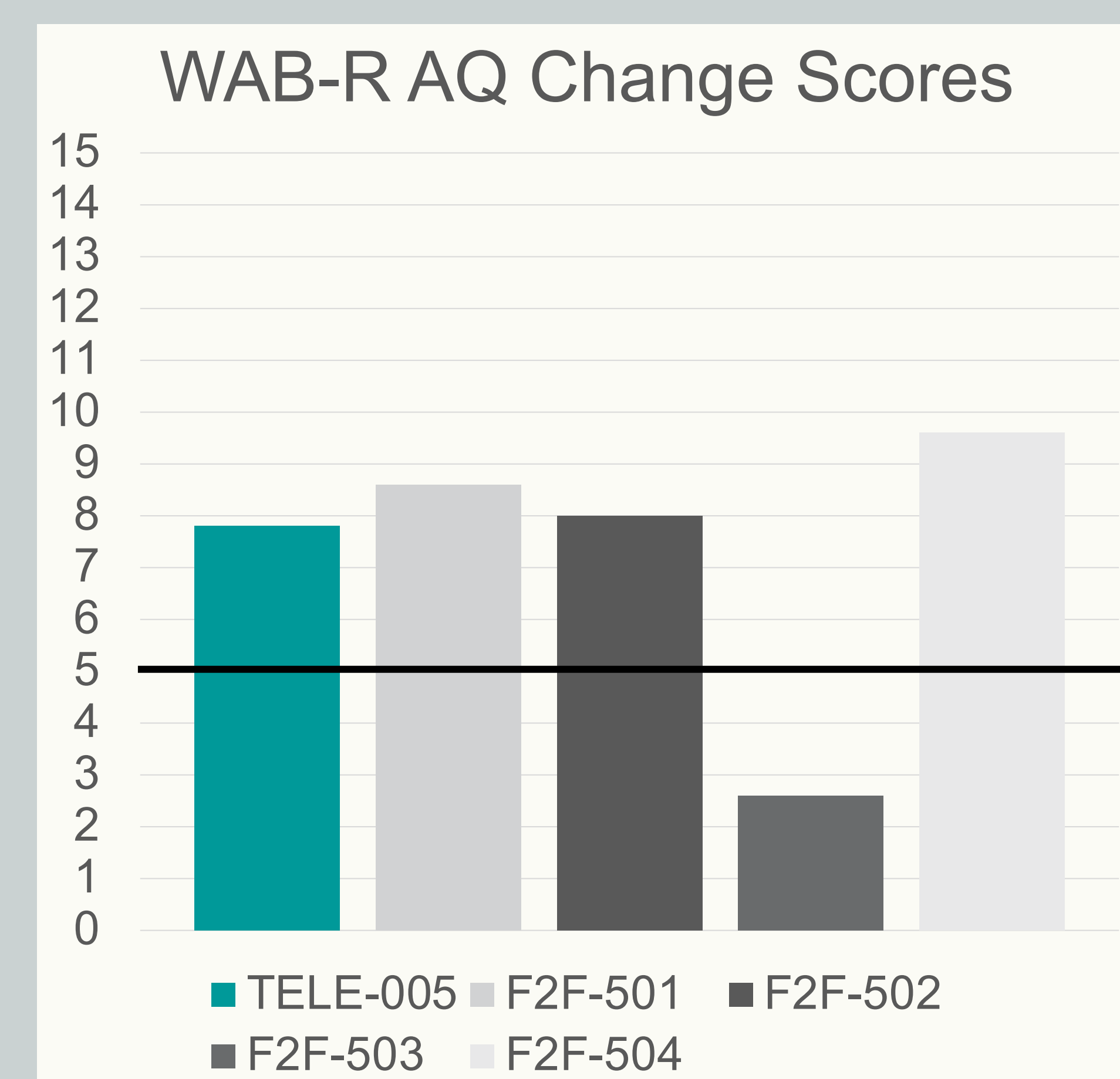
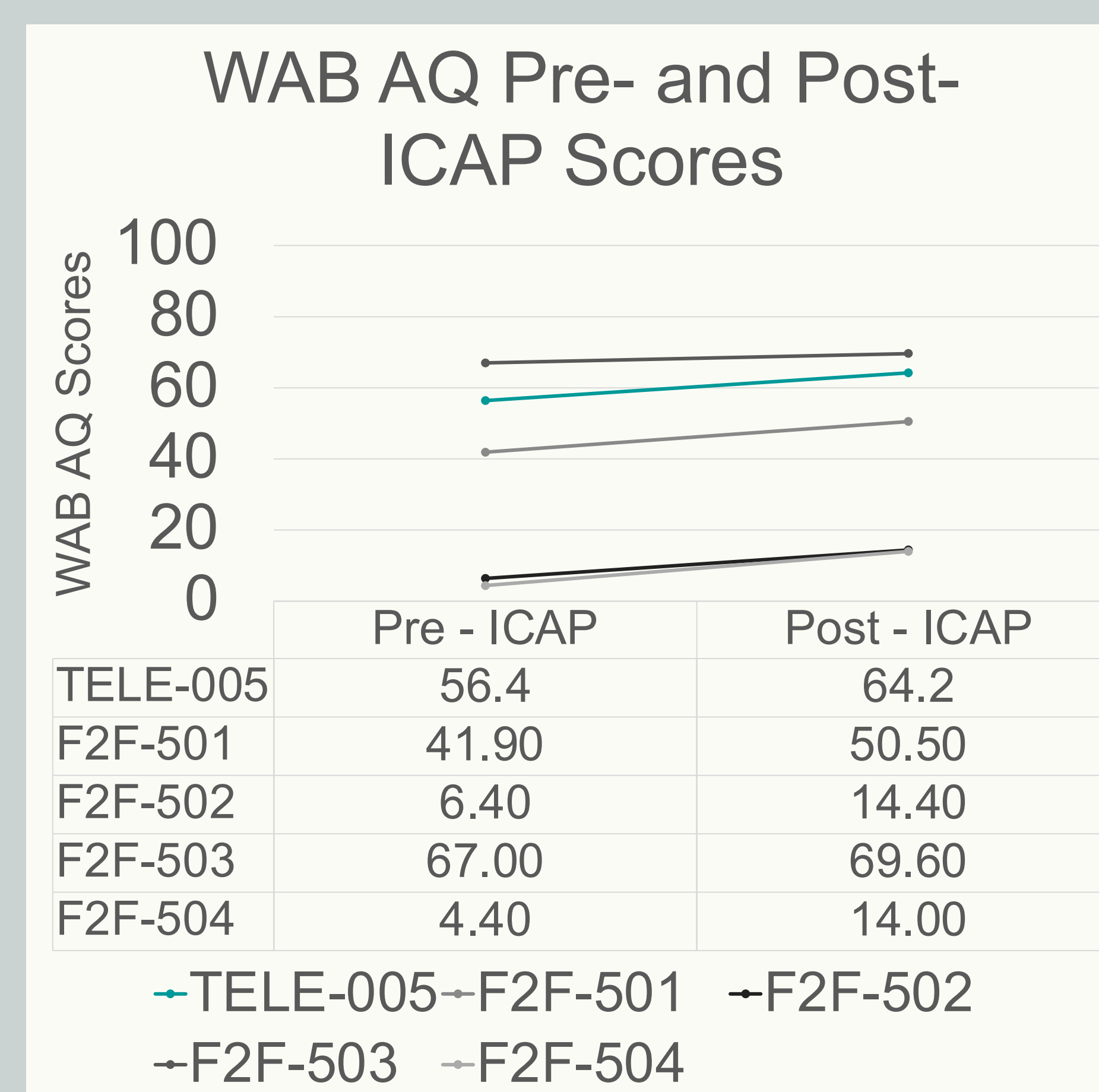
TELE-002- 43 year old female that was 18 months post stroke



TELE-003- 55 year old male that was 10 months post stroke



TELE-004- 72 year old male that was 17 months post stroke



TELE-005- 70 year old male that was 24 months post stroke

Kortney Sims & Claire Buehler
Mentors: Catherine Off & Jenna Griffin

BACKGROUND & SIGNIFICANCE

Stroke & Aphasia

- ~750,000 strokes occur in the US every year-up to 40% of stroke survivors have aphasia⁸
- 2-4 million people in the US currently live with aphasia⁸
- Aphasia is a **communication disorder** caused by stroke or brain injury¹
- Aphasia impairs reading, writing/texting, speaking, & listening to others speak¹²
- Aphasia does not impair intelligence¹²

Intensive Comprehensive Aphasia Programs (ICAPS)

- Cohort-based, holistic aphasia treatment that targets communication impairments, activity limitations, and participation restrictions using principles of neuroplasticity and patient-centered care^{2, 3, 4, 6, 10, 11, 12, 13, 14}
- Intensive:** must provide a minimum of 3 hours of therapy per day for 2 weeks^{2,3,4,6,10, 11, 12, 13, 14}
- Comprehensive:** must include individual and group treatment, and family education/training^{2,3,4,6 10, 11, 12, 13, 14}
- Significantly improves communication, psychosocial, and quality of life outcomes^{2,3,4,6,10,11,13, 14}

Telehealth & Aphasia Treatment

- Telehealth models of stroke and aphasia rehabilitation have grown rapidly, specifically since the onset of COVID-19 pandemic⁵
- Telehealth delivery of "usual care" aphasia therapy has been shown to be efficacious^{7, 8, 9, 16}
- Evidence supporting the efficacy of telehealth ICAPs have yet to be reported

RESEARCH QUESTION

Does a novel telehealth ICAP provide similar communication outcomes as a long-standing in-person ICAP when participants are matched for age, sex, and time post stroke?

METHODS

Participants

- Stroke survivors with chronic aphasia (>6 months post-stroke)
- n=5 telehealth ICAP participants (summer 2020)
- n=53 in-person ICAP participants (8 ICAPs implemented 2014-2019)

Participant ID	Age	Sex	Time Post Stroke	Occupational History	WAB-R PreAQ	WAB-R Post AQ	WAB-R Change Score
TELE-001	46	M	9.00	Photographer/ drone pilot	69.4	71.7	2.3
In-Person Mean	51	M	10.00		78.9	84.9	6.0
TELE-002	43	F	18.00	Supply Chain Manager	65.8	66.6	0.8
In-Person Mean	48	F	18.00		57.75	62.6	4.85
TELE-003	55	M	10.00	Civil engineer	85.8	89.5	3.7
In-Person Mean	55.5	M	9.25		61.08	65.7	4.625
TELE-004	72	M	17.00	Assistant District Attorney	12.1	24.6	12.5
In-Person Mean	75.25	M	15.50		46.85	50.93	4.08
TELE-005	70	M	24.00	Dentist	56.4	64.2	7.8
In-Person Mean	67.75	M	26.25		29.93	37.13	7.20

Research Design

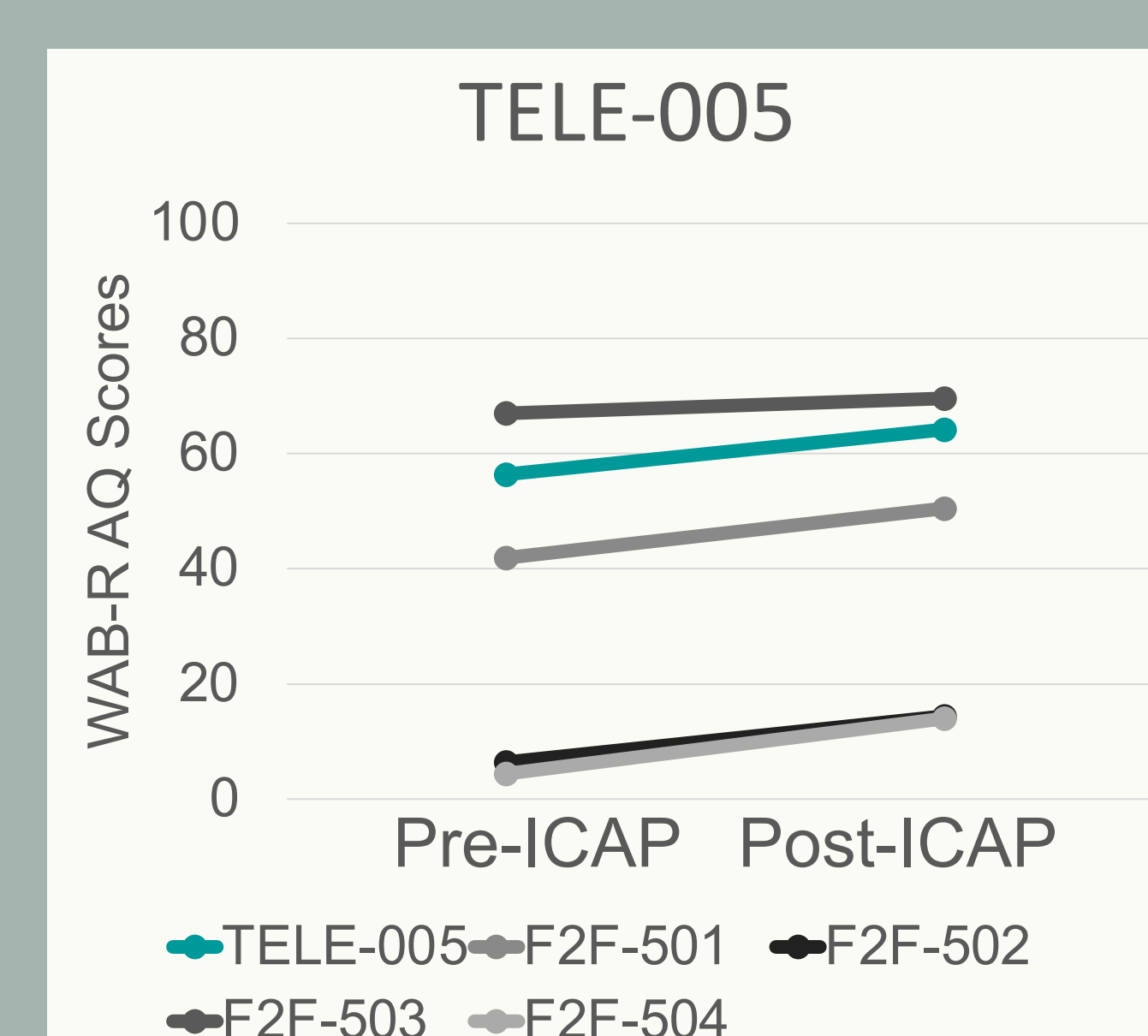
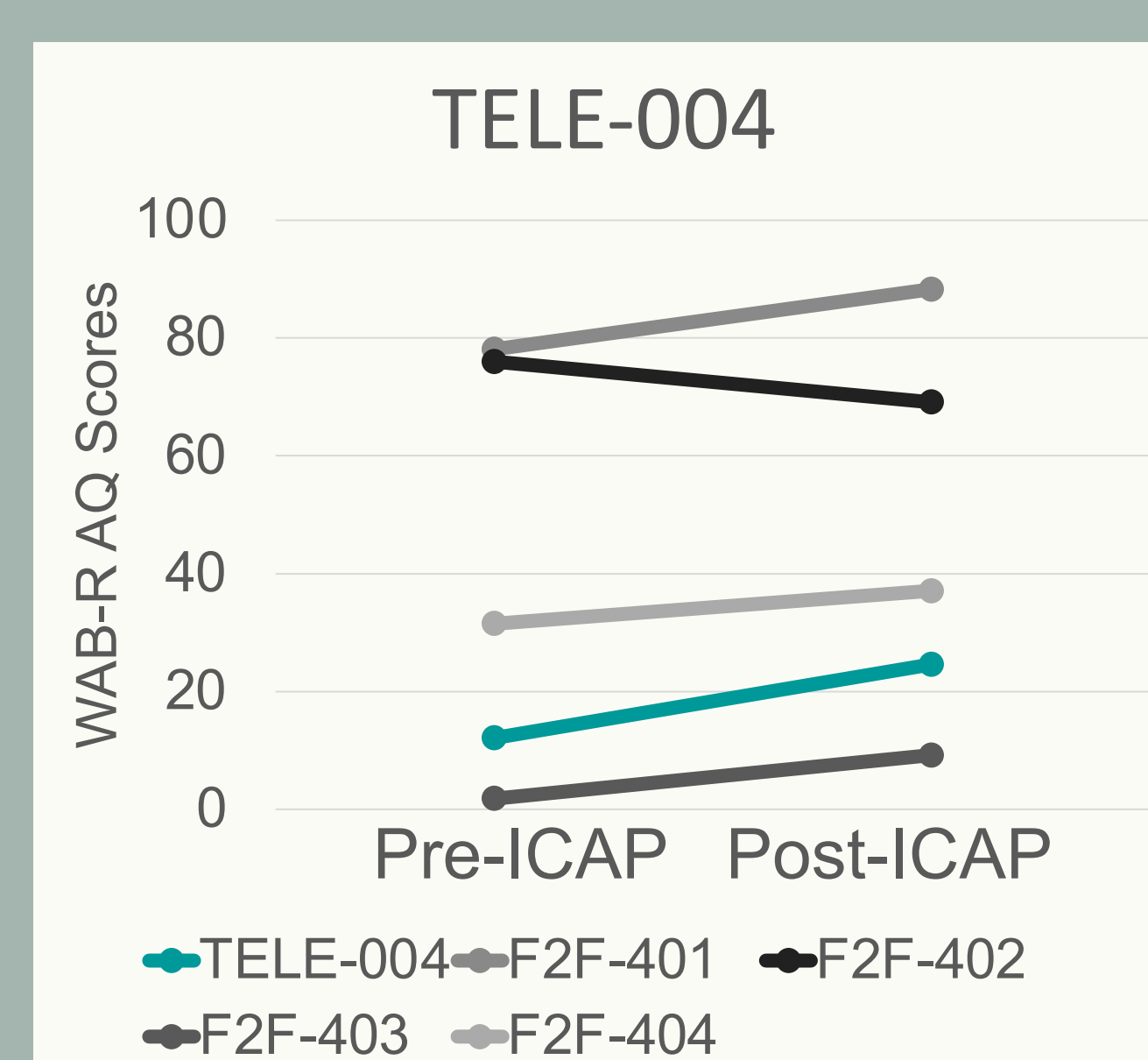
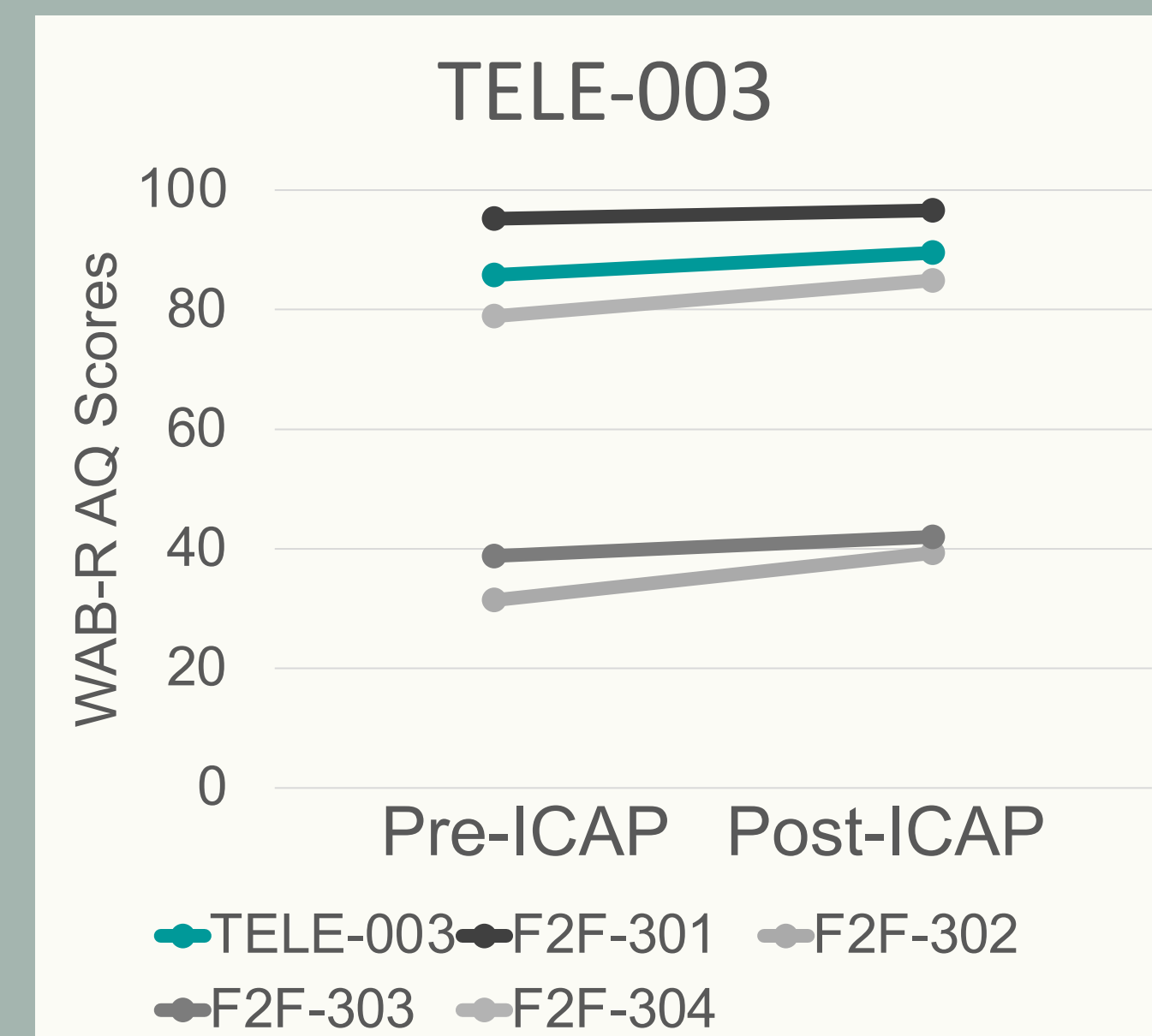
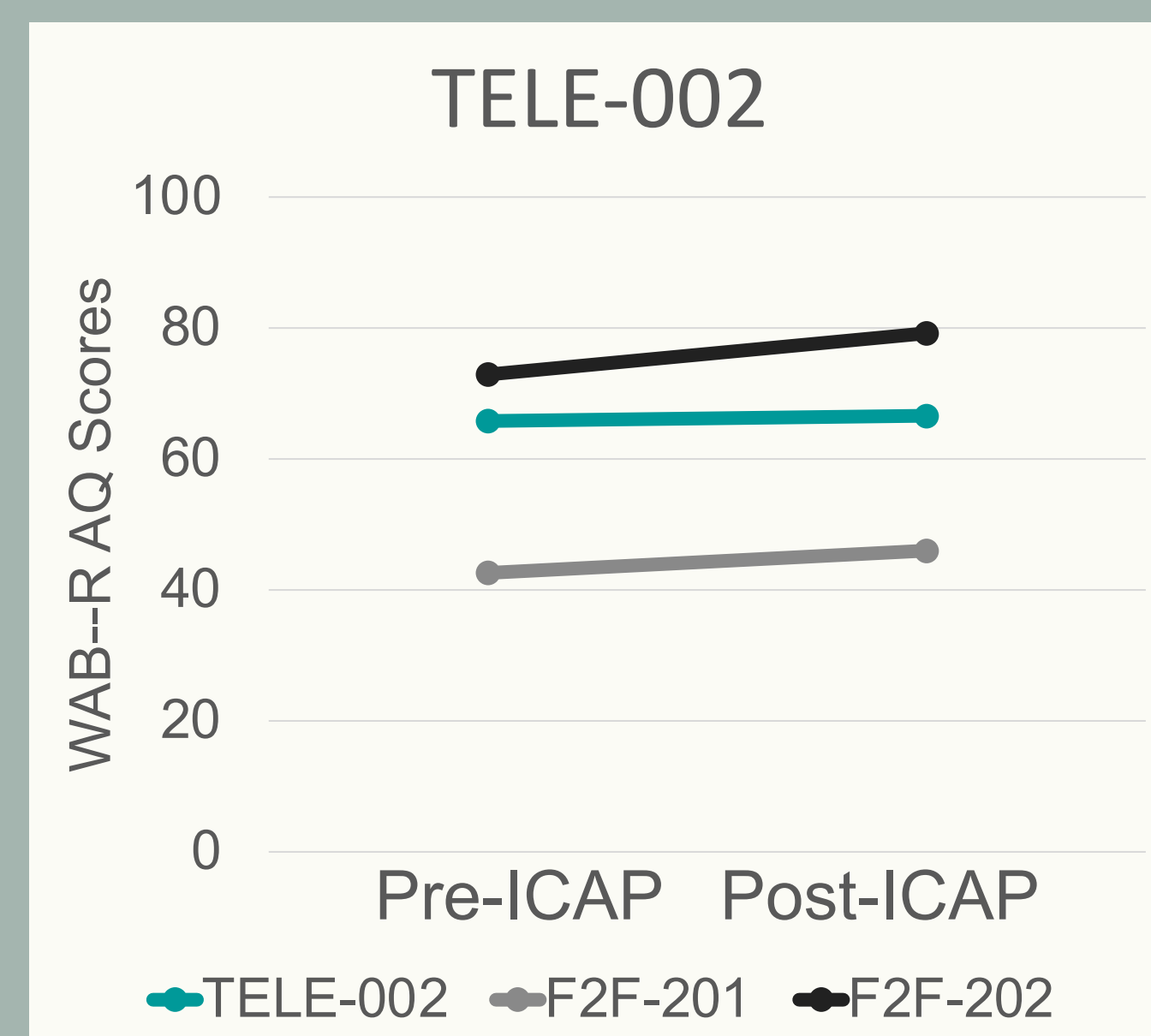
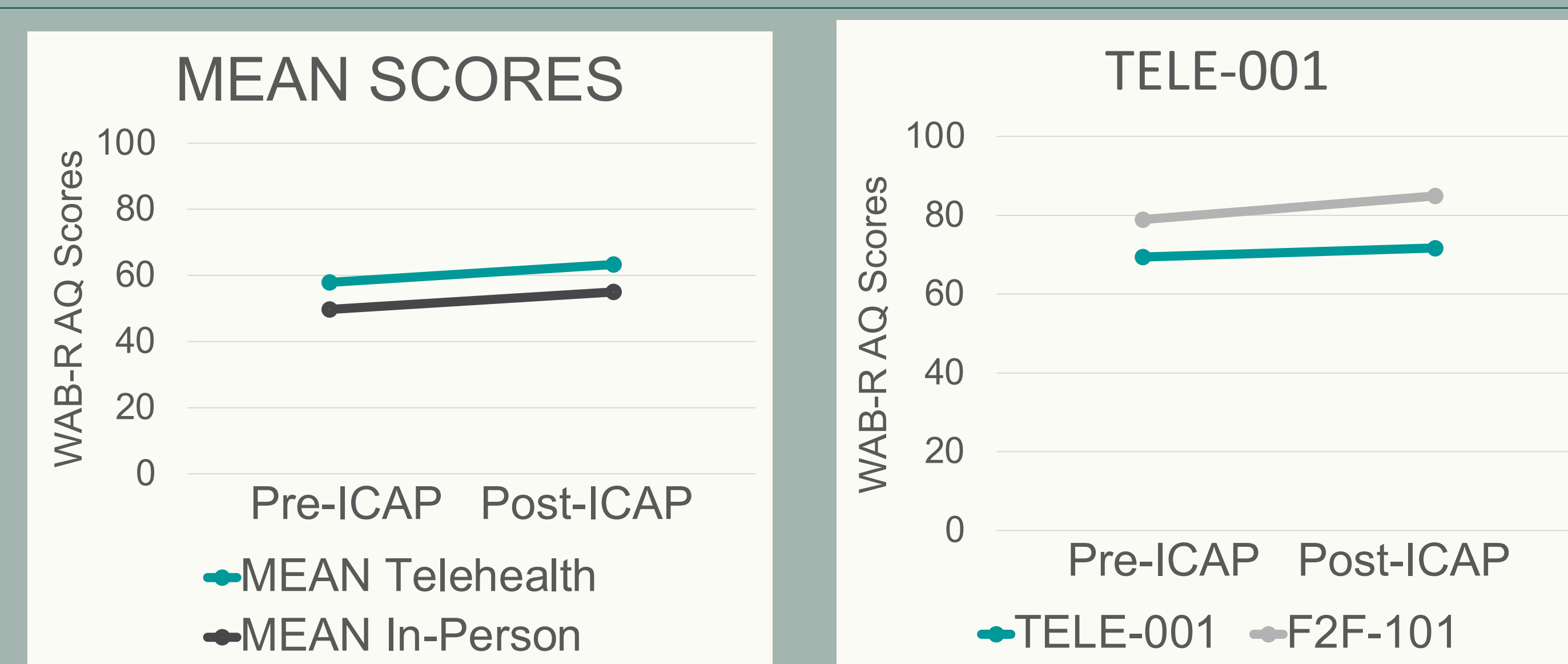
- Retrospective, pre/post group design
- Comparison of telehealth & in-person ICAP cohorts

Procedures

- Telehealth participants were matched with participants from the 2014-2019 data set
- Participants were matched for **age** (+/- 10 years), **biological sex**, & **time post stroke** (+/- 6 months)
- Communication outcomes were evaluated before and after each ICAP using the *Western Aphasia Battery-Revised* (WAB-R) Aphasia Quotient (AQ)
- Pre/post-ICAP WAB-R AQ scores were compared across telehealth and in-person participants to assess telehealth ICAP efficacy

RESULTS

	Telehealth ICAP (2020)	In-Person ICAPs (2014-2019)
Total Treatment Hours	45	Mean = 66
Mean Pre-ICAP WAB-R AQ	57.9/100	49.72/100
Mean Post-ICAP WAB-R AQ	63.32/100	55.01/100
Mean Change Score WAB-R AQ	5.42	5.29



SUMMARY OF FINDINGS & IMPACT

Communication outcomes for stroke survivors with aphasia who participated in a novel telehealth ICAP (summer 2020) were similar to outcomes from long-standing in-person ICAPs (2014-2019)

- Telehealth ICAPs are likely to be as efficacious as in-person ICAPs
- Offering both in-person and telehealth ICAPs may increase access to post-stroke services for stroke survivors with aphasia beyond the COVID pandemic – increasing the potential to reduce rural health disparities in Montana and the Mountain West

References

- 1 American Speech-Language-Hearing Association (ASHA). (2020). *Aphasia*. <https://www.asha.org/public/speech/disorders/aphasia/#:~:text=Aphasia%20is%20a%20language%20disorder,may%20lead%20to%20language%20problems>.
- 2 Babbitt, E. M., Worrall, L., & Cherney, L. R. (2016). Who benefits from Intensive Comprehensive Aphasia Program. *Top Lang Disorders*, 36(2), 168-184. <https://doi.org/10.1097/TLD.0000000000000089>
- 3 Babbitt, E. M., Worrall, L., & Cherney, L. R. (2015). Structure, Processes, and Retrospective Outcomes From an Intensive Comprehensive Aphasia Program. *American Journal of Speech-Language Pathology*, 24(4), S854-S863. https://doi.org/10.1044/2015_AJSLP-14-0164
- 4 Griffin-Musick, J., Off, C.A., Milman, L., Kincheloe, H., Kozlowski, A. (2020). The impact of a university-based intensive comprehensive aphasia program (ICAP) on psychosocial well-being in stroke survivors with aphasia. *Aphasiology*, 1-27. <https://doi.org/10.1080/02687038.2020.1814949>
- 5 Hoffman Jonathan, Shayegani Ramona, Spoutz Patrick, Virtual academic detailing (eDetailing): A vital tool during the COVID-19 pandemic.(2020). *Journal of the American Pharmacists Association : JAPhA.*, 60(6), E95.
- 6 Hoover, E. L., Caplan, D. N., Waters, G. S., & Carney, A. (2017). Communication and quality of life outcomes from an interprofessional intensive, comprehensive, aphasia program (ICAP). *Topics in Stroke Rehabilitation*, 24(2), 82-90. <https://doi.org/10.1080/10749357.2016.1207147>
- 7 Keidel, M, Vauth, F, Richter, J, Hoffmann, B, Soda, H, Griewing, B, & Scibor, M. (2017). Home-based telerehabilitation after stroke. *Nervenarzt*, 88(2), 113-119.
- 8 Kurland, Jacquie, Liu, Anna, & Stokes, Polly. (2018). Effects of a Tablet-Based Home Practice Program With Telepractice on Treatment Outcomes in Chronic Aphasia. *Journal of Speech, Language, and Hearing Research*, 61(5), 1140-1156.
- 9 Marshall Jane, Booth Tracey, Devane Niamh, Galliers Julia, Greenwood Helen, Hilari Katerina, Woolf Celia. (2016). Evaluating the Benefits of Aphasia Intervention Delivered in Virtual Reality: Results of a Quasi-Randomised Study. *PLOS One*, 11(8), E0160381
- 10 National Aphasia Association. (2016). Aphasia Statistics. <https://www.aphasia.org/aphasia-resources/aphasia-statistics/#:~:text=About%20750%2C000%20strokes%20occur%20each,in%20Great%20Britain%20with%20aphasia>.
- 11 Persad, C., Wozniak, L., Kostopoulos, E. (2013). Retrospective Analysis of Outcomes from Two Intensive Comprehensive Aphasia Programs. *Top Stroke Rehabil (2013)*, 20(5), 388-397. <https://doi.org/10.1311/tsr2005-388>
- 12 Rodriguez, A. D., Worrall, L., Brown, K., Grohn, B., McKinnon, E., Pearson, C., Van Hees, S., Roxbury, T., Cornwell, P., MacDonald, A., Angwin, A., Cardell, E., Davidson, B., & Copland, D. A. (2013). Aphasia LIFT: Exploratory investigation of an intensive comprehensive aphasia programme. *Aphasiology*, 27(11), 1339-1361. <https://doi.org/10.1080/02687038.2013.825759>
- 13 Rose, M. L., Cherney, L. R., & Worrall, L. E. (2013). Intensive Comprehensive Aphasia Programs: An International Survey of Practice. *Topics in Stroke Rehabilitation: The Intensive Comprehensive Aphasia Program (ICAP): Implementing Evidence-Based Practice*, 20(5), 379-387. <https://doi.org/10.1310/tsr2005-379>
- 14 Simmons-Mackie, N. (2018). Aphasia in North America. Moorestown, NJ: Aphasia Access. Retrieved from www.aphasiaaccess.org
- 15 Trebilcock, M., Worrall, L. E., Ryan, B., Shrubsole, K., Jagoe, C., Simmons-Mackie, N., Bright, F., Cruice, M., Pritchard, M., & Le Dorze, G. (2019). Increasing the intensity and comprehensiveness of aphasia services: Identification of key factors influencing implementation across six countries. *Aphasiology*, 33(7), 865–887.
- 16 Weidner, Kristen, & Lowman, Joneen. (2020). Telepractice for Adult Speech-Language Pathology Services: A Systematic Review. *Perspectives of the ASHA Special Interest Groups*, 5(1), 326-338. <https://doi.org/10.1080/02687038.2019.1602860>